

AVIATION WEEK

APR. 7, 1952

50 CENTS

A MCGRAW-HILL PUBLICATION

TEXAS



KOREA



PUERTO RICO



A "FOLLOW THROUGH" THAT REACHES AROUND THE WORLD

It's always seemed to us that making a good product and getting it into airplanes represents only about half of a manufacturer's responsibility.

What's needed after that to make the job complete is a thorough "follow through" in the field—where the airplanes actually see service.

That's why in the Honeywell organization we have a group of carefully selected Service Engineers. They're stationed around the world, as these on-the-spot photos indicate.

Their job is to trouble-shoot and flight-test Honeywell controls—Autopilots, Engine Controls, Electronic Fuel Gauges, Gyros and other control equipment—in dozens of different kinds of aircraft. And their job, too, is to help train Air Force, Navy and airline crews in maintenance of their control equipment, as well as to recommend design changes and figure new ways to meet new control problems.

We expect our staff of Service Engineers to grow larger in future years. Because automatic control is so important a part of aviation progress. And automatic control is Honeywell's business.

AERONAUTICAL DIVISION
MINNEAPOLIS-HONEYWELL • MINNEAPOLIS 13, MINN.

MINNEAPOLIS
Honeywell

Aeronautical Controls



ENGLAND



FLORIDA



- 3** nations...
2 armed services...
3 airlines...
7 airplane manufacturers—

are now proving Hytrol
*anti-skid
 braking
 system*

a new world-wide standard

in braking efficiency for fighters,

bombers and transports—produced by **Hydro-Aire Inc.**

HYDRO-AIRE CORPORATION
 A Subsidiary of Goodyear

B.F. Goodrich



Rubber keeps ice out so flying boom can come in

When the Flying Boom—Boeing's telescoping tube for mid-air refueling—diverts fuel to a plane in flight, it fits into a special opening in the receiving ship called an in-flight boeing receptacle.

In designing the receptacle, Boeing engineers faced a problem: if icing continues while in flight should cause ice to build up the opening, it would block up the opening, making it impossible for the boom to move. Looking for the best way of keeping ice from forming, Boeing brought the problem to B. F. Goodrich.

It seemed like a job for electrically heated rubber—thick, tough rubber heated by a core of electric resistance

wires. But to put the heat where needed, the heated rubber would have to block out some of the receptacle area—so snugly over bulges, around complicated curves and corners, it was a tricky job.

B. F. Goodrich formed heated rubber into twelve molded sections which would fit together skin tight over the contours of the receptacle. For its part, the electrical construction proved to be the answer. And heated rubber is now used on refueling receptacles for the B-47.

B. F. Goodrich heated rubber is a highly efficient way of preventing ice accumulation. It is flexible, saves weight, has a long life. Besides refueling

receptacles, BFG heated rubber is doing a successful job on propellers, control surfaces, wings, air scoops, many other parts. It is a typical development of the BFG engineering staff through that supplies answers with the answers to tough problems. B. F. Goodrich problems list systems now include tires, wheels and brakes, heated rubber, Detroit pressure sealing gaskets, Arvires, inflatable seals, fuel cells, accumulators, known The B. F. Goodrich Company, Akron, The B. F. Goodrich Company, Akron, Ohio.

B.F. Goodrich
 FIRST IN RUBBER

GOV'T SPEC

specialist relies on Polyken



TAPING SHOT the common key, that is the day's mobile about one. "You can use Polyken Tape No. 214. You can use what's already made a package for emergency (upper left), a valve cover (upper right), as well as the maintenance pack which is in your equipment."



COMPLYING WITH GOV'T SPEC, these tape machine shows make sense on used with Polyken No. 214, ready for immediate shipment.

How to meet Government Specification JAN-P-127-Amend 3 safely, economically

Designing and setting for Gov't Spec and experts to the business of August G. Barker Co., Milwaukee. They rely on Polyken Industrial Tapes—made by the company that makes 30 tapes covering Government Specifications JAN-P-127-Amend 3.

For example, on U. S. Army mobile generators, manufactured by Chrysler, Dodge Co., Baltimore uses Polyken No. 214 to seal all openings—papers, pipes, hoses, and seal bearings and dust, moisture and heat.

Polyken No. 214, used here, is black. Also available in many other colors—will conforming to the same Government Specifications—will equally fast, safe, economical.

These 30 tapes represent only a small part of our full line of "Tapes that do things you never thought tape could do." And in response for line samples and booklets.

Polyken®

INDUSTRIAL TAPES

Department of Rubber & Block
Division of The Keadell Company

Polyken, Dept. RWD
222 West Adams St., Chicago 4, Illinois
For specifications, samples and further information
see No. 214 and other Polyken tapes. Please send
me your FREE BROCHURE, "Tapes in a Tact".

Name _____ Title _____
Company _____
Street Address _____
City _____ State _____

NEWS DIGEST

DOMESTIC

Depth DC-48 gross takeoff weight has been raised to 107,000 lb from 90,000 lb with CAA approval. Nearly all the increased weight allowance will be used for fuel. Pan American World Airways will get the first 107,000 lb configuration.

First F-86B Sabre has been delivered to USAF by North American Aviation. This new model features the more powerful 3,600-hp plus thrust J47-G27 turbojet, also has the hydraulically controlled dismountable horizontal tail.

U. S. civil aircraft exports during February totaled 23 units of 6,000 lb and less worth \$336,546.

Wing Gen. Jesse D. Austin, Deputy Director of Operations for Fighter, Strategic Air Command, and his wife, Lt. Col. Frances R. Austin, were killed Mar. 31 when their B-25 crashed while attempting to land at Offutt AFB, Omaha.

Wright Aeronautical division and CIO-ILAW Local 699 have agreed on a new contract providing a 12-cent annual increase for 16,000 workers. The union struck two Wright plants in New Jersey for three weeks last September, but stepped to work when President Truman ordered the dispute to WSE.

Boeing-Wichita and IAM Local 70 have agreed on a five-year deal of living contract, retroactive to Nov. 6, 1951, through Apr. 15. New agreement, which extends through Mar. 31, 1955, includes program for cost-sharing from

Wichita's rate range structure to the Seattle's rate job evaluation plan and single rate structure.

FINANCIAL

American Airlines' net income for 1951 totaled \$10,544,662 after taxes, recovery being \$163,977,000. The company paid \$3.50 in dividends on its \$100 par value preferred stock, during the year and ten 15-cent dividends per share of common.

Trans World Airlines earned \$8,511,000 last year after paying \$5,033,000 in taxes. Total operating assets were more up 25.0% over the previous year, being \$144,913,000.

Colonial Airlines had \$76,355 net profit during 1951 compared with 1950's loss of \$110,921.

Mid-Continent Airlines reports a \$38,717 net loss for January after a profit for income taxes. Operating revenues totaled \$791,810 for the month.

Jack & Hazelt, Inc., Cleveland, has declared 15-cent dividend per common share and a regular quarterly dividend of 50 cents per share of cumulative preferred stock, 4% stock (\$50 par value). Dividend payment will be made Mar. 1 to holders of record on Apr. 15, shareholders of the preferred stock will be paid July 3 for stock recorded on June 30.

Electric Boat Co.'s consolidated net income in 1951 totaled \$1,672,201 on net sales of \$82,658,015. Company's backlog on Feb. 29 was \$171,790,066. Then has General Electric Aircraft Corp. to work on aircraft engine lines of nuclear engines.

The Sperry Corp., N. Y., took an additional net income of \$70,000,000 for 1951 on shipments of \$246,875,677. Booking at the end of February totaled \$611 million.

INTERNATIONAL

First production DH Helios four engine transport has made its initial flight and is shortly to be flown to New Zealand for use as a surveillance. DH recently secured a contract for 14 Helios from Canada's Indian Air Force. The British Air Registration Board has recently approved submission of DH's C-119A (C-119A) to be used from 500 to 600 hours.

LEWIS

Inducting Transmitters

for temperature testing
in the laboratory
or in the plane...

Constructed with the same care as our standard transmitters, these generators bring "result quality" to the test engineer.



MODEL 100P, above, has been used successfully for testing jet engine components for heat treating on the "Proving Ground" in which performance results are obtained in a controlled environment. Model 100P is available in various sizes and in both standard and custom configurations. Models in larger sizes, having much greater heat capacity, are available.



MODEL 100P, left above, has been used successfully for testing jet engine components for heat treating on the "Proving Ground" in which performance results are obtained in a controlled environment.

MODEL 100S, right above, has been used successfully for testing jet engine components for heat treating on the "Proving Ground" in which performance results are obtained in a controlled environment.

STANDARD AVAILABLE—Models 100P, 100S, 100T, 100U, 100V, 100W, 100X, 100Y, 100Z, 100AA, 100AB, 100AC, 100AD, 100AE, 100AF, 100AG, 100AH, 100AI, 100AJ, 100AK, 100AL, 100AM, 100AN, 100AO, 100AP, 100AQ, 100AR, 100AS, 100AT, 100AU, 100AV, 100AW, 100AX, 100AY, 100AZ, 100BA, 100BB, 100BC, 100BD, 100BE, 100BF, 100BG, 100BH, 100BI, 100BJ, 100BK, 100BL, 100BM, 100BN, 100BO, 100BP, 100BQ, 100BR, 100BS, 100BT, 100BU, 100BV, 100BW, 100BX, 100BY, 100BZ, 100CA, 100CB, 100CC, 100CD, 100CE, 100CF, 100CG, 100CH, 100CI, 100CJ, 100CK, 100CL, 100CM, 100CN, 100CO, 100CP, 100CQ, 100CR, 100CS, 100CT, 100CU, 100CV, 100CW, 100CX, 100CY, 100CZ, 100DA, 100DB, 100DC, 100DD, 100DE, 100DF, 100DG, 100DH, 100DI, 100DJ, 100DK, 100DL, 100DM, 100DN, 100DO, 100DP, 100DQ, 100DR, 100DS, 100DT, 100DU, 100DV, 100DW, 100DX, 100DY, 100DZ, 100EA, 100EB, 100EC, 100ED, 100EE, 100EF, 100EG, 100EH, 100EI, 100EJ, 100EK, 100EL, 100EM, 100EN, 100EO, 100EP, 100EQ, 100ER, 100ES, 100ET, 100EU, 100EV, 100EW, 100EX, 100EY, 100EZ, 100FA, 100FB, 100FC, 100FD, 100FE, 100FF, 100FG, 100FH, 100FI, 100FJ, 100FK, 100FL, 100FM, 100FN, 100FO, 100FP, 100FQ, 100FR, 100FS, 100FT, 100FU, 100FV, 100FW, 100FX, 100FY, 100FZ, 100GA, 100GB, 100GC, 100GD, 100GE, 100GF, 100GG, 100GH, 100GI, 100GJ, 100GK, 100GL, 100GM, 100GN, 100GO, 100GP, 100GQ, 100GR, 100GS, 100GT, 100GU, 100GV, 100GW, 100GX, 100GY, 100GZ, 100HA, 100HB, 100HC, 100HD, 100HE, 100HF, 100HG, 100HH, 100HI, 100HJ, 100HK, 100HL, 100HM, 100HN, 100HO, 100HP, 100HQ, 100HR, 100HS, 100HT, 100HU, 100HV, 100HW, 100HX, 100HY, 100HZ, 100IA, 100IB, 100IC, 100ID, 100IE, 100IF, 100IG, 100IH, 100II, 100IJ, 100IK, 100IL, 100IM, 100IN, 100IO, 100IP, 100IQ, 100IR, 100IS, 100IT, 100IU, 100IV, 100IW, 100IX, 100IY, 100IZ, 100JA, 100JB, 100JC, 100JD, 100JE, 100JF, 100JG, 100JH, 100JI, 100JJ, 100JK, 100JL, 100JM, 100JN, 100JO, 100JP, 100JQ, 100JR, 100JS, 100JT, 100JU, 100JV, 100JW, 100JX, 100JY, 100JZ, 100KA, 100KB, 100KC, 100KD, 100KE, 100KF, 100KG, 100KH, 100KI, 100KJ, 100KK, 100KL, 100KM, 100KN, 100KO, 100KP, 100KQ, 100KR, 100KS, 100KT, 100KU, 100KV, 100KW, 100KX, 100KY, 100KZ, 100LA, 100LB, 100LC, 100LD, 100LE, 100LF, 100LG, 100LH, 100LI, 100LJ, 100LK, 100LL, 100LM, 100LN, 100LO, 100LP, 100LQ, 100LR, 100LS, 100LT, 100LU, 100LV, 100LW, 100LX, 100LY, 100LZ, 100MA, 100MB, 100MC, 100MD, 100ME, 100MF, 100MG, 100MH, 100MI, 100MJ, 100MK, 100ML, 100MM, 100MN, 100MO, 100MP, 100MQ, 100MR, 100MS, 100MT, 100MU, 100MV, 100MW, 100MX, 100MY, 100MZ, 100NA, 100NB, 100NC, 100ND, 100NE, 100NF, 100NG, 100NH, 100NI, 100NJ, 100NK, 100NL, 100NM, 100NN, 100NO, 100NP, 100NQ, 100NR, 100NS, 100NT, 100NU, 100NV, 100NW, 100NX, 100NY, 100NZ, 100OA, 100OB, 100OC, 100OD, 100OE, 100OF, 100OG, 100OH, 100OI, 100OJ, 100OK, 100OL, 100OM, 100ON, 100OO, 100OP, 100OQ, 100OR, 100OS, 100OT, 100OU, 100OV, 100OW, 100OX, 100OY, 100OZ, 100PA, 100PB, 100PC, 100PD, 100PE, 100PF, 100PG, 100PH, 100PI, 100PJ, 100PK, 100PL, 100PM, 100PN, 100PO, 100PP, 100PQ, 100PR, 100PS, 100PT, 100PU, 100PV, 100PW, 100PX, 100PY, 100PZ, 100QA, 100QB, 100QC, 100QD, 100QE, 100QF, 100QG, 100QH, 100QI, 100QJ, 100QK, 100QL, 100QM, 100QN, 100QO, 100QP, 100QQ, 100QR, 100QS, 100QT, 100QU, 100QV, 100QW, 100QX, 100QY, 100QZ, 100RA, 100RB, 100RC, 100RD, 100RE, 100RF, 100RG, 100RH, 100RI, 100RJ, 100RK, 100RL, 100RM, 100RN, 100RO, 100RP, 100RQ, 100RR, 100RS, 100RT, 100RU, 100RV, 100RW, 100RX, 100RY, 100RZ, 100SA, 100SB, 100SC, 100SD, 100SE, 100SF, 100SG, 100SH, 100SI, 100SJ, 100SK, 100SL, 100SM, 100SN, 100SO, 100SP, 100SQ, 100SR, 100SS, 100ST, 100SU, 100SV, 100SW, 100SX, 100SY, 100SZ, 100TA, 100TB, 100TC, 100TD, 100TE, 100TF, 100TG, 100TH, 100TI, 100TJ, 100TK, 100TL, 100TM, 100TN, 100TO, 100TP, 100TQ, 100TR, 100TS, 100TT, 100TU, 100TV, 100TW, 100TX, 100TY, 100TZ, 100UA, 100UB, 100UC, 100UD, 100UE, 100UF, 100UG, 100UH, 100UI, 100UJ, 100UK, 100UL, 100UM, 100UN, 100UO, 100UP, 100UQ, 100UR, 100US, 100UT, 100UU, 100UV, 100UW, 100UX, 100UY, 100UZ, 100VA, 100VB, 100VC, 100VD, 100VE, 100VF, 100VG, 100VH, 100VI, 100VJ, 100VK, 100VL, 100VM, 100VN, 100VO, 100VP, 100VQ, 100VR, 100VS, 100VT, 100VU, 100VV, 100VW, 100VX, 100VY, 100VZ, 100WA, 100WB, 100WC, 100WD, 100WE, 100WF, 100WG, 100WH, 100WI, 100WJ, 100WK, 100WL, 100WM, 100WN, 100WO, 100WP, 100WQ, 100WR, 100WS, 100WT, 100WU, 100WV, 100WW, 100WX, 100WY, 100WZ, 100XA, 100XB, 100XC, 100XD, 100XE, 100XF, 100XG, 100XH, 100XI, 100XJ, 100XK, 100XL, 100XM, 100XN, 100XO, 100XP, 100XQ, 100XR, 100XS, 100XT, 100XU, 100XV, 100XW, 100XX, 100XY, 100XZ, 100YA, 100YB, 100YC, 100YD, 100YE, 100YF, 100YG, 100YH, 100YI, 100YJ, 100YK, 100YL, 100YM, 100YN, 100YO, 100YP, 100YQ, 100YR, 100YS, 100YT, 100YU, 100YV, 100YW, 100YX, 100YY, 100YZ, 100ZA, 100ZB, 100ZC, 100ZD, 100ZE, 100ZF, 100ZG, 100ZH, 100ZI, 100ZJ, 100ZK, 100ZL, 100ZM, 100ZN, 100ZO, 100ZP, 100ZQ, 100ZR, 100ZS, 100ZT, 100ZU, 100ZV, 100ZW, 100ZX, 100ZY, 100ZZ.

THE LEWIS ENGINEERING CO.
Manufacturers of Co-axial Temperature Measuring Systems for Aircraft
NORWICH, CONNECTICUT

Our largest *Lineator*[®]
has 10,000 lb. working capacity



Although the R-302 LINEATOR—our largest electric linear actuator—weighs less than 22 pounds for a 6-inch stroke, it has a working capacity of 5 tons continuously and an ultimate static capacity of 10 tons.

Speeds—at 10,000 pounds load—are from 10 to 25 feet per minute, depending on the motor and gearing. The R-302 has nonreturning internal piston rings and adjustable limit switches which operate through external relays.

Dimensions and performance data—with maximum power motor—on R-302 and other Airborne Linearators are given in the I.A.S. Aeronautical Engineering Catalog.

AIRBORNE
ACCESSORIES CORPORATION
8414 Chestnut Avenue, Hillside 5, New Jersey

RAAC

AVIATION CALENDAR

- Apr. 8-12—Society of the Plastics Industry annual technical sessions, national plastics dinner, Edgewater Beach Hotel, Chicago.
- Apr. 15-17—American Institute of Electrical Engineers, conference dinner meeting, Hotel Jefferson, St. Louis, Missouri papers Apr. 15-16.
- Apr. 18—International Federation of Airline Pilots' Associations annual convention, Sydney, Australia.
- Apr. 21-24—National Association Meeting and Aircraft Engineering Display, Society of Automotive Engineers Hotel Statler, New York.
- Apr. 22—Institute of the Aeronautical Sciences meeting, Cleveland West section Cleveland.
- Apr. 25—International Air Transport Association Convention special committee meeting, Brussels, Brussels.
- Apr. 28-May 2—American Institute of Electrical Engineers, mathematics seminar meeting, Madison Hotel, Washington, N.Y., sessions papers Apr. 28.
- May 2-6—South Atlantic Intercollegiate Air Meet, Great Barrington, Mass.
- May 5-7—Soviet-American Program in Quality Electronic Components, sponsored by Institute of Radio Engineers, American Institute of Electrical Engineers and Radio & Television Manufacturers Association, sessions in Dept. of Aeronautics, Langley Research Center, Washington, D.C.
- May 9-10—International Air Transport Association conference dinner, Copenhagen.
- May 14-16th annual Western Association Conference Hotel Sherfield, Glenside, Ill.
- May 17—International Air Transport Association conference dinner, Hotel Statler, New York.
- May 18-24—National conference on electronic electronics, sponsored by Institute of Radio Engineers, Dayton section and Philadelphia, Greater Philadelphia Association, Dayton Ballroom Hotel, Dayton, Ohio.
- May 15-16—American Helicopter Society annual dinner and banquet, Hotel Washington, Washington, D.C.
- May 17-18—National Fairs Air Meet and Race, Cleveland, Ohio.
- May 20—International Air Transport Association technical committee and technical contact for meeting, Copenhagen.
- June 4-10—National Air Pollution Association annual meeting, air pollution seminar on June 10, Hotel Statler, New York.
- June 15-25—American Society of Mechanical Engineers, symposium on duct and ribble flow, internationalization, Pennsylvania State College, Pa.

PICTURE CREDITS

—Boeing, 10—Boeing, 11—Boeing, 12—Boeing, 13—Boeing, 14—Boeing, 15—Boeing, 16—Boeing, 17—Boeing, 18—Boeing, 19—Boeing, 20—Boeing, 21—Boeing, 22—Boeing, 23—Boeing, 24—Boeing, 25—Boeing, 26—Boeing, 27—Boeing, 28—Boeing, 29—Boeing, 30—Boeing, 31—Boeing, 32—Boeing, 33—Boeing, 34—Boeing, 35—Boeing, 36—Boeing, 37—Boeing, 38—Boeing, 39—Boeing, 40—Boeing, 41—Boeing, 42—Boeing, 43—Boeing, 44—Boeing, 45—Boeing, 46—Boeing, 47—Boeing, 48—Boeing, 49—Boeing, 50—Boeing, 51—Boeing, 52—Boeing, 53—Boeing, 54—Boeing, 55—Boeing, 56—Boeing, 57—Boeing, 58—Boeing, 59—Boeing, 60—Boeing, 61—Boeing, 62—Boeing, 63—Boeing, 64—Boeing, 65—Boeing, 66—Boeing, 67—Boeing, 68—Boeing, 69—Boeing, 70—Boeing, 71—Boeing, 72—Boeing, 73—Boeing, 74—Boeing, 75—Boeing, 76—Boeing, 77—Boeing, 78—Boeing, 79—Boeing, 80—Boeing, 81—Boeing, 82—Boeing, 83—Boeing, 84—Boeing, 85—Boeing, 86—Boeing, 87—Boeing, 88—Boeing, 89—Boeing, 90—Boeing, 91—Boeing, 92—Boeing, 93—Boeing, 94—Boeing, 95—Boeing, 96—Boeing, 97—Boeing, 98—Boeing, 99—Boeing, 100—Boeing.

AVIATION WEEK, April 3, 1952

Washington Roundup

New Key West Conference?

Congressional pressure, in being put on the Pentagon to hold another Key West conference to rework strategic policy and reassign missions of the services in the light of recent conditions.

The source, Congressional leaders, says the services are heading up to all directions, activities are overlapping, effort is being needlessly duplicated at the taxpayer's expense.

Rep. Frank Sweeney, member of House Appropriations Committee, commented: "It would appear another Key West conference is due. Since no major changes have taken place in technological progress and in strategy throughout the world, such as the advent of the Korean War, it might be well to go back and check previous decisions and see whether some other changes might not now be in order."

Naval aviation is back of the proposal. It was from the 1948 Key West strategic plan, now comprising a direct U. S. Russian war that Air Force emerged as the dominant service.

Who's Wrang: USAF or Navy?

Public statements indicate that USAF and Naval Aviation are not agreed on points of fact.

Vice Adm. John Canada, Deputy Chief of Naval Operations for Air, "We can deliver an A-bomb from a carrier. The Senate of it is that the aircraft carrying the A-bomb can be with a complete jet-fighter escort, all the way to and from the target."

Undersecretary of Air Russell Gilgus: "The B-36 bomber is what today... between the carrier today and an attack by Korea. Of the planes that we have today, it alone has the capability to deliver atomic bombs on Russian targets."

Conceding this to the House Appropriations Committee: "In our general offensive capability, the small aircraft carriers have opened additional possibilities to world aviation. There are many targets against which the small carrier is the preferable weapon."

All Naval attack vessels and long-range fighter aircraft for which we have been looking contracts over the coming year will be able to deliver the small atomic bombs. Moreover, we have modified a number number of our fighters and attack planes already built and building to achieve the same capability.

"Despite the considerable offensive strength that the small Avengers give to Naval aviation, we have not ignored the fact that some specific targets may be dealt with better by the large bomber. We now have in our current in attack plane capable of delivering the big bomb. A greatly improved carrier based attack plane is in production."

Gilgus, explained to the same committee: USAF must continue having B-36 over the coming year for delivery through August, 1954, because it will be our two and a half years before it can be replaced by the delivery of the B-47, B-60 and the B-52 will be in service operations.

Finletter: Abolish Public Relations

Secretary for Air Thomas Finletter would cut off direct relations between USAF and the press, he proposed. Let USAF present information to Congress and Co-

gressmen present it to the public—through the press or otherwise.

His comment: "The policy is to the maximum extent possible to bring out information that we want to bring out through presentation of the problem to Congress. We would like to see Congress take over some of this function of asking in the questions and getting the answers from us and then giving them to the public."

His suggestion to House Appropriations Committee: "Cut out all funds for military public relations staff."

Finletter directed USAF's PR staff at the Pentagon from No. 36 to 47 when he pulled it from Chief of Staff Gen. Hoyt Vandenberg a few weeks back and put it under his control.

Some sources expect it to be off widespread "look me" of USAF's altered stance to avoid news outlets in military news while their stories published.

Big-Scale Plane Buying

Prospect is that Air Force and Naval aviation will be able to start contract letting in the coming year already announced program prompts at the start of the fiscal year July 1.

It is the first time in recent years that it has been possible. Last year that budget wasn't approved by Congress until mid-October.

But House Appropriations Committee already has completed hearings on requests. Last year it was 100 days before hearings were over.

Railroads' Lost Friend

Railroad interests have stopped back-pulling the proposals for operating without government support and backing subsidization of the scheduled airlines.

Naval spokesman Angus Herndon, president of Air Corps Transport Association, urged House Appropriations Committee to approve \$100 million in Civil Aeronautics Administration plans to see for testing jets for passenger transport operations.

He had a "bet" though that the Committee first would be "bumping" airlines that most of the money would be devoted to civil plane leasing and that ACTA members would be eligible for testing contracts.

Herndon then to the needs that advice of Civil Aeronautics Board Member Joseph Adams. Instead of being a series of tests, airlines now should support the passenger jet testing program—and put the air line in a large testing program. This is the interests of over all aviation development.

The result: Both the airlines and railroads lost out. The Committee heard from the \$100 million request.

Less for Air Safety

Civil Aeronautics Administration wants more money for general operations for the coming year, which starts July 1—but plans to cut back on air safety which has been the year.

Out of the \$107 million CAA has for salaries and expenses for the current 1952 fiscal year, \$11.8 million is allocated to "aviation safety."

But out of the \$112 million CAA is asking for next year, only \$11.7 million for aviation safety.

—Katherine Johnson

When it "Points"
the Enemy suffers



it's the Cessna L-19 Bird Dog

Roaming over hostile trenches . . . "telling us" exactly air and ground fire . . . finding and supplying out-of-GI units—it's all in a day's work for the rugged Cessna "Bird Dog." On duty in combat as in no-man's-land every day, this flexible L-19 observer has proved itself tops for "telling us" enemy troops.

It's tops with U.S. Army and Marine pilots, too! They prize the "Bird Dog's" powerful H125 horsepower engine, the Cessna patented landing gear and high lift flaps that permit take-offs and landings in short, rough fields never before visible!

They like the "Bird Dog's" all-around visibility, too! Its wide, slantable all-around construction and the multiple radio installation that permits contact with both air and ground units.

Swaghest of all "Bird Dog's" bonuses, however, is the typical combat industryman: He knows the L-19 was specially designed and engineered to provide him with better, more accurate battle information, to make his job easier and keep him safer. We're proud that the "Bird Dog" does its job. And, we're doubly proud it's a Cessna!



WHO'S WHERE

In the Front Office

David E. Deane, formerly of Bell Aircraft Corp., has joined Avco Corp., New York, as a vice president and will direct the firm's newly formed Aerospace division. Deane is a director of the Aero Club of Buffalo.

Rear Adm. Clyde W. Smith, USN, (Ret.) has been appointed assistant to the president of Kellogg International Corp., Evanston, N. Y. Smith was formerly director of the National Transportation Division in charge of materials and equipment for BuAer, Washington, D. C. He is a graduate of Annapolis class of 1918.

What They're Doing

Alfred M. Phillips, formerly with Colonial Aeronautics, has joined David E. Deane Associates, public relations control whose head office is in New York.

T. W. Fowler has accepted as manager of the Wright Aeronautical Division.

Changes

Donald G. Wink, editor of Electronics magazine since 1946, is leaving the McGraw-Hill Publishing Co. to join Plenco Corp. in June. He is an indicator of research and development.

Robert E. Hicks, formerly president of the Avco Corp., Springfield, Conn., has been appointed manager of Pacific Aerospace Corp.'s Commercial Aircraft Division. PAC is located at Redwood.

Herold C. Tavel, formerly chief pilot for Lockheed Aircraft Corp., has been designated director of flying operations. His department, in addition to flight testing, also encompasses test and development, radio operations, and flight engineering and flight operations training. Now Lockheed chief pilot who has been named are Carl E. Fettes and Carl Smith.

Charles J. Basse has been appointed controller of Kollsman Corp. at America, Wilkes-Barre, Conn.

A. E. Merrill, acting chief of flight tests, Boeing Seattle, has been transferred to the Wichita division as chief of flight and John W. Fennimore returns to Seattle to take over as chief of flight test. Merrill joined Boeing in 1940, has flown the B-17, B-24, C-47, F4U, P-51, and P-52. Fennimore joined the company in 1944, tested the B-27, B-26, B-47, B-50 and C-47.

John L. Simon, Jr., has been elected chief man of the board of New York Aeronautics, Inc., and Robert L. Cummings, Jr., has been chosen president of the recently reconstituted scheduled passenger helicopter service. Simon is an aviation consulting engineer who formerly was with American Airlines and Glenn L. Martin Co. Cummings' prior experience was in the transport service of Pan American World Airways.

INDUSTRY OBSERVER

►Massachusetts-based electronic attitude gyroscopes manufactured by USAF contract approximately 1,000 parts and cost \$4,500 per unit. The device is subcontracted to 47 component manufacturers and parts and supplies are obtained from 97 other sources. Manufacture of parts requires 1833 hours and assembly and test for M48 requires an additional 1923 hours.

►New Convair two-engine S2F anti-submarine plane, which Navy uses is the first to be designed "from scratch" for carrier anti-submarine work, will be delivered beginning late this year.

►Delaware will start this fall on the first BRL-1 autonomous helicopter, which can be loaded on carriers and other surface ship decks, as well as on small carriers.

►Navy intention to House Appropriations Committee shows the new Douglas A-1D to be a short range, atomic carrier lander cost \$12,500,000 apiece. They have been made and a contract for 17 more is progressing to be followed by mass production when the cost figures are expected to drop.

►Chance Vought's F7U Cutlass jet fighter is costing the Navy \$2 million a copy in the quantities which Navy is buying so far, Congress is told. Congress questioned, as do some industry people in the house, a report that the electronic equipment on the F7U cost only \$20,000. New super-sensitive communication system for voice and pitch damping, taken-made for the Chance Vought Cutlass F7U jet fighter, has been developed by General Electric. Chance Vought has reported that the system is designed so that it can be made into a complete automatic pilot at a later date by addition of several more components.

►Navy is planning to get into the night-light reflecting art along with the Air Force and will equip a number of its planes for aerial reflecting. So far, Navy has not disclosed its requirements for reflecting tanker planes, or whether they will be carrier based.

►Design from ordered into effect last May is the Air Force on current production combat aircraft has been revised to use basic change per year per plane. These generally will include such power plant, armament and electronic gear changes.

►There were 46 Boeing KC-97 tankers in operational service for USAF as of Dec. 31, 1953. Boeing will continue deliveries to the Air Force through 1952 at a rate of eight per month. Equipped with the Boeing-developed "Pump-Boost" system, the big tanker carries less than 5,500 gal of transportable fuel in the lower compartment of the figure-eight-shaped fuselage. Its tanker version upper fuselage section is streamlined.

►In January 1953, Bell Aircraft Corp.'s Niagara Falls plant will be devoted almost entirely to production of guided missiles, according to Bell Aircraft Executive Charles F. Fennell. The company will continue some production for Bell helicopters and subcontracting for Bell and Bell aircraft at other plants. Fennell said, "We're practically done with experimental aircraft. The X-4, X-5 and X-6 are being completed now."

►The Boeing B-52 supersonic night jet engine handles, probably never successor to the General B-36, does not have the long-range intercontinental capabilities of the B-36, according to disclosures made by Captain Bill 1953 budget hearings. In light of the B-52, along with the B-47, is being altered to make it an effective SAC (strategic) weapons. (This article was approved for publication in Aviation Week by Air Force security review.)

►Comments for aircraft by Air Force and Navy to North Atlantic Treaty Organization under Mutual Defense Agreement will be sent and concluded by January, 1953, according to 1953 budget testimony.



NEW THUNDERBOLT: The fighter-bomber version of the F-84 (foreground) and the photo reconnaissance F-84F, shown in test flights over Edwards AFB, Calif. Both are equipped with Wright-built J47 Suprajet jet engines.

2 New F-84Fs

- Fighter-bomber, photo recon types scheduled.
- Six .50-cal. guns and 24 rockets arm fighter.

Production is scheduled to begin late this year on two new versions—fighter bomber and photo reconnaissance—of Republic's Mustang Corp.'s surprising 1951 Thunderjet. Both models will be led in at the end of the straight wing F-84 line, currently turning out an estimated 50 to more planes per month at Republic's Farmingdale, N. Y. plant.

A preproduction prototype of each model is now undergoing flight tests at Edwards AFB, Calif. Major differences between these and the earlier F prototype is in the use of wingroot air intakes for the Wright-built J47 Suprajet jet engines.

• **Fighter Bomber**—The F-84F—mated



VERSATILITY is emphasized in new Republic F-84F. It can carry a wide variety of armament, more standard operational loads are illustrated above.

15,347—will make its first appearance with the earlier nose intake, to simplify production changeover. Later editions of the model will have the solid nose and wing intake.

Performance of the F is classified, except for the statement that it can fly faster, higher and farther than the F-84B series now in Korea.

Standard armament is a complement of 30-cal machine guns, four in the nose and one in each wing root. External armament a much more formidable, including 24 5-in. HVAR rockets or four 1,000-lb. bombs. Additional fuel-including 210-gal. drop tanks and zero weight—which might mean two 1,000-lb. bombs or six 500-lb. bombs—can be made into alternate loads.

The F can also function as a long range escort fighter on this role, it can tow two 450-gal. fuel tanks which increase miles of action to well over 1,000 mi.

Close inspection of the F photo shows that its nose nose begins at the original junction of spin nose cone and fuselage frame.

• **Photo Recon**—The RF-84F has a completely new nose from a windshield forward. The prototype has shown that up to the sides and front of the nose which indicate the camera location. Production versions presumably will carry other sensors or windows looking forward.

Four 50-cal machine guns are the RF-84F's armament.

Production version of the RF-84F featured 15,327 in its related with it, but the wing root intake of the prototype.

There are some minor differences in appearance between the two new models and the first F-84F prototype. The new ones have the tail fins cut down to half height, which gives a more rounded appearance to the exhaust nozzles.

The earlier rocket shows the marks of the production change in-flight tests based on the Republic's internal desire to increase barrier resistance.

Both new airplanes lack the wing root intake of the conventional F and both have at least one major change in the V-tail which characterizes the first model.

Air Force General to Head War College

LEAD GEN Howard A. Craig, USAF, has been appointed the new commander of the National War College by President Truman, replacing Lt. Gen. Harold B. Bull. U. S. Army. Named to replace Craig is Inspector General of the Air Force was Maj. Gen. Brent L. Bennett, now commanding USAF's peacetime ground, Fifth AF, Ft. S.

CAA Funds Cut

- Proposed budget slashed \$18.8 million in House.
- Navigation and airport funds trimmed most.

Objecting to government support of the aviation industry through maintenance of the federal aviation system, House Appropriations Committee slashed \$18.8 million off Civil Aeronautics Administration's proposed \$157.5 million budget for the coming 1953 fiscal year which will begin July 1.

The cutback to \$144.3 million would require substantial reimbursement of CAA whose current year budget totals \$157.5 million.

Seconding the President's recommendation that a system of survey charges be established, the committee considered. The survey charges has reached the point where it needs less government support.

• **Jet Test One**—The committee fully noted the request for \$1.4 million to start a testing program of jet prototype transport with the observation that "This type of aircraft development should be carried on and financed by the plane manufacturers and the commercial airlines rather than the federal government."

Civil Aeronautics Board's budget for the coming year was slashed \$150,000 to \$5,500,000, slightly below the \$5,750,000 the Board has this year.

• **CAA's Budget**—Following are details on the House Committee's action on CAA's budget.

• **General Administration**, Capped \$2.5 million, reducing the allocation for salaries and expenses to \$886,000 which will still permit a slight expansion of CAA's staff. Allocation for the current year—\$100 million. The committee stipulated that "No part of the reduction is to be applied in its current year reduction in a permanent salary reduction."

• **Establishment of air navigation facilities**, Cut \$6 million off CAA's request for \$21 million. The \$13 million allowed will provide for improvement of existing facilities, but not for additional facilities.

• **Airports**, Trimmed \$5.5 million off the \$25.5 million asked by CAA. On the \$21 million allowed \$15 million is to be expended through contracts, \$11 million is for major airports on the continent, \$120,000 for parts in Puerto Rico, \$250,000 for Hawaii, \$125,000 for Alaska and \$50,000 for the Virgin Islands and the remainder for administration.

• **Air navigation development**, Cut \$30,000 off the \$2 million requested for planning and development of a system of aids to air navigation and traffic control allowing \$1,750,000.

Australian Sabre To Get New Avionics

(McGraw-Hill World News)

McBarnes, Australia-Sabre plans for the Australian built Sabre have undergone yet another change and it is now revealed that it will have a more advanced Rolls Royce Avon engine than originally planned.

With the new engine the top speed of the plane should be at about 720 mph.

The Commonwealth Aircraft Corporation is presently today up for the production of the RA-7 Avon engine, but if the new plans are realized that engine will not be used in Sabres but will be installed on the twin engine Canberra bombers also being made in Australia under license.

The new Avon engine for Sabres may develop up to 585 more horsepower than the current RA-5. That would be almost twice the horsepower now chosen for Sabres operating in Korea.

The Australian built Sabre also will have an extended range of operation in comparison with present U.S. models. But the first Avon means for both the Canberra and the Sabre will have to come from England. In expectation of this the Commonwealth Aircraft Corporation is completely incorporating its Fishburne's Bond facilities.

RAF Now Has Two Canberra Squadrons

(McGraw-Hill World News)

London—The Royal Air Force has ordered its first jet bomber squadron.

No. 311, based for its studies in the German tactical research station at Peenemunde during the last war is now operating English Electric Canberra B Mk. 3 which are three.

Another well known British unit, No. 617, which utilized the Mosquito and later the Canberra B Mk. 12 is in the process of being equipped with Canberras. Both units are based at Mildenhall, Lancashire.

The Canberras must be equipped to operate from airfields and personnel units provided them to go up or time under. A new unit to deal with at high altitudes is being tested.

A. W. Roper and Hamilton Page, in addition to English Electric, will build Canberras. English Electric has delivered more than 50 planes than for



ARRESTER WIRE stops a Supermarine Attacker short on deck of carrier HMS Eagle.



TIED TO CATAPULT, Attacker will be "kicked off" by catapult in launches.



STILL WINGS FOLDED, two Attackers are hoisted on deck awaiting further flight duty.

Eagle Gets First Royal Navy Jets

New British carrier in shakedown cruise with Vickers Attacker squadron; Sea Hawks coming later.

By Nat McKitterick
(McGraw-Hill World News)

OF Spitfires, English Channel—The Royal Navy's newest carrier, the 45,000-ton Eagle, is being broken in with the Royal Navy's first carrier-borne jet squadron. The press got a look at six Vickers Attackers of the Eagle's

Squadron 800 in takeoff and landing practice.

After only four flying days, the Eagle's officers and men were getting the jets off from the Eagle's launch catapult at sea and a half airborne.

The Eagle still has an cock house for jets, so each aircraft had to be stored below after landing. Consider-

ing that, the average time of 55 seconds from touch down to cleared decks looked very good for a new carrier with a new aircraft.

For Hawker Cuth—The Attackers, powered by a single Rolls-Royce Newton, looked like penguin birds when they hit the Eagle's arresting gear. Obviously the carrier was "land on" to hoist and later aircraft. The Attackers were fitted with self-dumping arrester hooks which enabled the pilot to wait no time tending to the warning klaxon lift. The lift itself is a new, high speed variety.

The Attackers were positioned in the hydraulic catapult by an automatic device which snugged the tail wheel into line. A nose hook had to be fixed to the aircraft and catapult by hand, which operation, when combined by the self-spacer crew, should cut the 90-second interval time still further.

Sometime this year the Royal Navy's new steam catapult (Aviation Week May 14, p. 31) will be installed on the Eagle. HMS Pegasus has just returned from Norfolk where the catapult was demonstrated to the U. S. Navy. The British report highly favorable reaction.

How It Works—The steam catapult operates on the principle of a slotted cylinder and has no rams or hydraulic pistons. The hook to which the aircraft is joined is directly attached to a piston, driven along the cylinder by high pressure steam from the ship's main boilers. Besides speeding up launches, the steam catapult will reduce the need for runways to some for long periods into the week before launching these aircraft.

The Eagle is equipped with a comprehensive system of light dark lighting for jet operations at night. While the carrier's armament is light-16 4.5 in. guns in the main battery, and 61 four caliber automatic-in speed and maneuverability are important. Below decks, there is a control room not unlike those used by RAF Fighter Command.

Recent for 100 Pioneers—The carrier can accommodate about 100 aircraft, all of which should be ready by June. Included will be five squadrons of Attackers—attacked as interim type until the three Sea Hawk comes into service later this year. A squadron of eight Fieser Firebrakes now on one added a touch of the prototype to the demonstration. With these recently folded wings, the Firebrakes handled very awkwardly compared to the sleek Attackers. In the air, they looked like sitting ducks.

The Eagle's overall length is 503 ft 9 in.; water line breadth, 112 ft 9 in.; displacement, 45,000 tons. The crew complement of 85 officers and 1,377 ratings, including embarked air squadrons.



... proven ability to serve Aviation

Outstanding records of accomplishment achieved by Auto-Lite thru ever continuing research and advancements in products and production methods . . . point to Auto-Lite

as a logical source of supply for the aviation industry. Engineering, production and design facilities are available.

THE ELECTRIC AUTO-LITE COMPANY
Detroit, Michigan



Manufacturers of...

BATTERIES • BURNERS • FUEL PUMPS • IGNITION • GENERATORS
STARTING UNITS • STOP MOTORS • STOP MOTION CHAINS
SWITCHES • STARTING MOTORS • INSTRUMENTS & GAUGES
SPARK PLUGS • SPARK PLUGS • SPARK PLUGS
WIRE & CABLE • BRASS PIPES • METAL FABRICATING EQUIPMENT
HEAT TREATING • BOND & ALUMINUM BONDING EQUIPMENT
WIRELESS LTD.

Auto-Lite "Suspension" . . . CBS Radio Mondays . . . CBS Television Tuesdays



Building the World's Best Aircraft...

For example, the
**F-86E
SABRE JET**
on the assembly line at
North American Aviation, Inc.,
Los Angeles, California

Here's one insight for the **F-86E**—
This new super-control F-86E Sabre
also makes up the assembly line at
North American Aviation, Inc. for the
F-86E, as all modern aircraft.

There is Reynolds Aluminum in almost every
airplane that flies today.
The aircraft industry has learned to de-

pend on Reynolds for consistently high
quality and uniform and on workable
problems of development and engineering.
Reynolds completely interrelated
operations from the mining of raw materials
to the delivery of aluminum in all its
forms, assuring dependability of supply.
And, moreover, active participation
in the development of new aircraft and
development of "Tomorrow's Most Advanced"

Helpful Material for Your Training Program

Reynolds Aluminum is on the job
with literature and movies to help
you with your personal training
program—add to your own know-
how. The complete library of
Reynolds Technical Books on alu-
minum design and fabrication is
available to you for the asking.
Please send your request on a
business letterhead, otherwise the
price of each book is one dollar.

- **A.B.C.s of Aluminum**
From mine to finished product
- **Aluminum Sales Book**
Minimum Order and Full Product
- **Aluminum Structural Design**
Designing with Aluminum Structures
- **Isolating Structures for Aluminum**
- **Finishes for Aluminum**
- **Finishing Aluminum (about Jan 1)**
- **Heat Treating Aluminum Alloys**
- **Aluminum Machine Alloys**
- **Aluminum Welding Alloys**
- **Welding Aluminum**

And to select large groups of present
and past sales volume in your training
program—get these 100,000 color coated
films from Reynolds Film Service.

• **SHARP OF THINGS TO COME** Internal
and external of the aluminum structure
process and the design engineering of
products. Featuring 100 minutes.

• **THE USE OF THE F-86E SABRE** Develop-
ment in aluminum structure and design
including their application in production
and descriptive drawings. Running time
22 minutes.

• **THE F-86E SABRE** The complete
story of aluminum from mine to finished
product. Centers of interest in aluminum.
Running time 20 minutes.



Write to Reynolds Metals Company, 2609 South Third Street, Louisville 1, Kentucky

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

FINANCIAL

KLM Loan Blazes a Carrier Trail

Grant for \$7 million is the first made by the World Bank
to an airline; Chase National Bank participates.

The \$7-million loan granted to KLM
Royal Dutch Airlines by the Inter-
national Bank for Reconstruction and
Development (World Bank) is the first
loan the World Bank has made to an
air carrier.

Further, a private bank, the Chase
National Bank, is participating directly
by agreeing to advance up to \$5 million
of the loan, the which it will receive
notes of KLM. This is also the
first instance where a private bank is
participating in a World Bank opera-
tion.

The carrier loan is guaranteed by
the Netherlands Government and will
further be secured by an Export Credit
Guarantee from the trans-Atlantic coun-
try.

The loan will run for 64 years and
will be repaid at 4 1/2%.

Government Aid—Of outstanding
and most lasting significance is the fact
of indirect support of the foreign air-
lines in support of their operations
through their governments. The sup-
port in this instance is granted through
the loan guarantee by the Netherlands
government. Certainly the relatively
low interest rate of 4 1/2% speaks for
the fact the loan guarantee by the carrier's
home government.

U.S. domestic airlines holding cer-
tificates of public convenience and
security limit the Civil Aeronautics
Board and implied support through
payments have recently paid a rate as
high as 7% for bank credits they have
received.

The current KLM loan is designed
to provide about 20% of the funds
needed to finance some \$33 million in
new equipment purchases in the
U.S. The balance of the funds re-
quired will be provided from the air-
line's own resources.

New planes on order are also
Lockheed Super Constellation, one
Douglas DC-68, one
DC-6A cargo plane, and six Con-
quer 149s.

This is not the first time Holland
has guaranteed KLM loan for funds
for equipment purchase in the United
States.

In 1947 KLM bought one Constella-
tion through an Export-Import Bank
credit of \$5,161,812, repayable in four
years at 5% interest. This loan was

guaranteed by the Dutch government
and has since been repaid in full by the
airline.

• **ECA Aid—KLM** has also benefited
from ECA grants. Since an equivalent
of ECA grants in local currency is re-
quired to be deposited by the home
country in a counterpart fund, the pro-
ceeds of such grants are not directly
reflected in the accounts of the com-
pany.

Available information indicates that
ECA procurement authorization for
shipment of aircraft, engines and parts
to the Netherlands totaled \$29,962,500
as of May 31, 1951, and that past
shipments, totaling \$15,417,000 as of
the same date, included \$12,400,000 in
complete aircraft, \$4,040,000 in aircraft
parts and accessories, \$7,650,000 in air-
craft engines and accessories, and
\$3,325,000 in other equipment. It is
believed that the bulk of these ship-
ments under the ECA program were
made to KLM.

In the end of 1945 ECA had al-
located \$8 million for the purchase of
American aircraft (mainly DC-6s) by
KLM.

The strong Netherlands government
interest in KLM stems from the im-
portance of the airline to the national
economy in linking the northern coun-
try with its colonies. At the 1949 year-
end, the government owed about \$325
of KLM's outstanding capital funds,
amounting some \$5 million dollar.
(The golden is now quoted at
\$0.2635.)

• **Government Control—Under a law**
of Aug. 12, 1939, the government hold-
ings of KLM stock were to be re-
duced to 45 million guilder from 51
million to 145 million guilder (\$53,
500,000).

Of the total amount, 50 million
guilder represent a conversion of pre-
viously authorized indebtedness of the
company to the government, and 25
million guilder are a new investment
by the state in the company. The
authorized capital was raised from 100
million to 200 million guilder, but
there is no indication of any reverse
is presently held stock.

The government apparently controls
today, directly and through the Nether-
lands Railways, some 90% of the stock
of the company, with corresponding
voting power. Most of the private



The Moto Steppers

provide 360° rotation and count
in clockwise motion in 2° or 5°
increments in standard 360° steps
but sufficient torque to drive
any low torque mechanism,
indicators, potentiometers,
sensors, switches, relays and
other devices. Features 36
steps, low life, automatic and
continuous.

See Model on Display Now. Price, \$1.10

Model	Size	Step	Rotation	Count	Output
Model 1	1/2"	2°	V	V	V
Model 2	1/2"	5°	V	V	V
Model 3	1/2"	2°	V	V	V
Model 4	1/2"	5°	V	V	V

*See Model on Display Now

Price for Engineering Data
S. M. GIANNINI & CO., INC.
Franklin 4, Calif.

Giannini

AEROTEC AUTOMATIC CONTROLS



Prove dependable in combat and transport operations



As Aerotec
Dual Fuel Switch
Top Mounted

Repairs, Boring, and other leading aircraft manufacturers are using many types of Aerotec Automatic Controls in increasing numbers. These controls are custom designed and built to meet specific problems of high speed and high altitude flight in today's aircraft. Each Aerotec automatic device proves rigid tests duplicating actual flight conditions to insure maximum efficiency and dependability.

The picture shows three typical designs that incorporate Aerotec Automatic Controls. The Republic P-47 Thunderbolt, a combat plane with, also Aerotec pressure switches and a new fuel boost switch notable for its use on low mounted auxiliary fuel tanks. Boring has long used Aerotec valves, fuel switches, and pressure switches on their famous planes.

Where you are faced with problems of adaptable controls for engine, landing gear and cabin heater applications, fuel transfer, flow indicators, etc., contact Aerotec. One of our representatives available in your area, ready to give prompt and able assistance at any time. Call or write.

... for AEROTEC controls custom-built to your needs contact THERMIX

AGENCY REPRESENTATIVES

CLEVELAND 25, OHIO	KANSAS CITY	KANSAS CITY, MO.	BOSTON 1, MASS.
LOS ANGELES 10, CALIF.	NEW YORK 10, N.Y.	PHOENIX 10, ARIZ.	PHOENIX 10, ARIZ.
LOS ANGELES 40, CALIF.	SEATTLE 1, WASH.	PHOENIX 1, ARIZ.	PHOENIX 1, ARIZ.
LOS ANGELES 40, CALIF.	SEATTLE 1, WASH.	PHOENIX 1, ARIZ.	PHOENIX 1, ARIZ.
LOS ANGELES 40, CALIF.	SEATTLE 1, WASH.	PHOENIX 1, ARIZ.	PHOENIX 1, ARIZ.

Project Engineers

THE THERMIX CORPORATION

Executive Office: T. C. CRUICK, LTD.
1445 E. Colburn St. W., Montreal 25, Quebec • 27 4241 St. James St. Quebec

THE AEROTEC CORPORATION

GREENWICH, CONNECTICUT
Designers and Manufacturers of Automatic Controls—Fuel, Landing, Fuel, and Cabin Heater—Pressure Switches, Fuel, Airflow, Differential and Pressure Types—Fuel Transfer, Top, Bottom or Side mounted—Single, Dual, or Tandem.

dashboards are nationals of the Netherlands government.

KLM has received government aid in the form of direct subsidies, capital investment, loans, guarantees of borrowing and expenditures for airports and other facilities. KLM received direct subsidies from the beginning of its activity until World War II. Under the latest agreement between the company and the government, approved by a law of Aug. 8, 1947, the Ministry of Transport and Waterways may propose that a subsidy be granted to the company, the amount to be determined from year to year.

No direct subsidies were given in 1946, 1947, 1948, and 1949, by the law of Aug. 21, 1950, however, the company was granted a direct subsidy of 27,100,000 guilder (\$7,113,000) to cover its loss in operating the service to the East Indies in 1949. In addition, a non-interest bearing loan of 10 million guilders (\$2,630,000) was made by the government to the company to cover the cost of the acquisition of the losses sustained in 1949. The law is responsible out of future profits only, with the provision that any unpaid balance remaining after 1960 is to be covered.

In view of these terms, this "loan" may, in effect, be considered as a form of direct subsidy—eventually acceptable out of future profits.

Government loans and guarantees have also been made indirectly by the Dutch government in the interest of KLM.

It is evident that KLM receives substantial support from its government. Subsidies are not a direct or very comparable in kind to those granted U.S. flag airlines by their government. The World Bank feels that KLM may be considered in some quarters as an instrument of subsidizing Dutch national operations—this time by the U.S. to foreign carriers. This is hardly correct as the World Bank recognizes what its name implies, although the bulk of its funds are derived from the U.S.

While KLM obtained funds on a highly favorable basis, the loan is not covered on a sound economic premise and will be self liquidating. Further, this credit facilitates the purchase of American equipment and parallels the Dutch policy with which to earn valuable foreign exchange, thus strengthening their economy.

—Self Attached

[KANSAS CITY] Certain bank given data in the above account is taken from the author's comprehensive independent report on Security Policies of Foreign Airlines prepared last year for the Interstate and Foreign Commerce Committee of the U.S. Senate.]

Now Available!

ALUMINUM FORGINGS FROM CANADA



The Aluminex Company of Canada, Ltd. ("Alumi"), whose products we distribute, is now prepared to supply additional tonnages of top-quality aluminum forgings to U.S. manufacturers.

Thus once again, Alumi facilities are available to help keep important American production moving. Alumi aluminum helps to keep more close a solid American metal-workers busy — busy forging out

the thousands of lightweight, long-lasting aluminum products so important to defense, industry, farms, and homes.

If you need or anticipate need of aluminum forgings, we suggest you discuss your requirements with us as soon as possible. Kindly address your inquiry to Aluminex Import Corporation, 800 Fifth Avenue, New York 20 — or telephone JU 4-6120.



ALUMINEX IMPORT CORPORATION

Exporting company in the Western Hemisphere, at the ALUMINEX LIMITED group

Offices and Agents in 40 cities
400 Fifth Avenue New York 20

Av. Jay Lido & Bayona 1276, Buenos Aires

Cable address: ALUMINEX
Rue De Valenciennes 16, San Paulo

A Breeze from JOY AXIVANE[®] AIRCRAFT FANS



The North American B-45 "Tornado" Bomber, like most U. S. aircraft, has many features designed solely for the flight personnel's comfort.

Acting on the logical assumption that a more comfortable pilot is a better pilot, North American engineers called for a cockpit-cooling system of Joy Axivane Fans to keep the flight personnel from melting while waiting for take-off on hot days. When the "Tornado" is airborne, the fans are used in conjunction with a heating system to furnish warm air for comfort during long flights. On the RB-45 photo-reconnaissance bomber, the same fans also keep the camera ports free from frost or fog.

The versatility of this system is largely dependent upon that of the Joy AXIVANE Fan. The fans used on the B-45A, B-45C, and RB-45C provide 250 CFM at 6.5" W.G., yet they are only 6.5" in diameter and weigh but 9 lbs.

• Joy designs and builds each fan to the exact requirements for which it is intended. Each fan, therefore, is custom-engineered for highest efficiency. For many purposes such fans can be supplied from the extensive line already designed. Each single and two stage units available. Optional features include wrought or forged alloy, heated or lagged construction, relief mechanisms, auto-lubrication, and control systems where required.

* * * * *

Here are some of the many uses for JOY AXIVANE Aircraft Fans: Windshield de-icing, windshield or wing de-icing, cabin heating, cabin ventilating, cockpit heating, cooling radiators, oil cooling, gear-box cooling, instrument cooling, air recirculation, and high-altitude pressurizer heating.

Write for Bulletin, or
Consult a Joy Engineer
100 Years of Engineering Leadership

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 25, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, EATON, ONTARIO



AERONAUTICAL ENGINEERING



New Data Released on Fairey Gannet

- Low maintenance time and twin-engine reliability keynote Double Mamba-powered anti-sub craft.
- Royal Navy's policy is to switch to jet types and thus cut gasoline storage hazards on carriers.

The Fairey Gannet, now in quantity production for the Royal Navy, is England's—and probably the world's—first turbo-prop-powered submarine hunter. As such, it incorporates several unique and many unusual design features.

Fairchild says it came about one year ago, when Fairey Aviation Co. Ltd. announced that a production contract had been awarded the firm by the Ministry of Supply in recognition of the Admiralty (AVIATION WEEK MAR. 5, 1951).

Now a second, and more detailed look, is provided partly by Fairey and Avions Sables-Motors Ltd. in what the British firm in "representation" of certain characteristics of the Gannet.

► **Turbo-prop Engines**—The single outstanding feature of the Gannet is the Double Mamba turboprop powerplant. This Avions Sables engine is actually a twin, that is it consists of two independently operating engines which can be run in a pair or independently. Each engine drives a propeller, both props are concentrically mounted and are counter-rotating. Elsewhere it would be anticipated that they do oper-

ate independently, and both props cannot be driven by one engine.

Recognized features of the Gannet are its appearance—deep fuselage, with three main crew sitting high, inverted gull wing, truncated tail, and the characteristic, wavy low where the engines.

Much of the disposable load of the

Gannet is taken up with anti-sub war fare. Attack weapons are stored in the bomb bay, and armaments and other gear can be slung under the wings. Radar is housed on a speed, retractable radome which is lowered when the crew is out for space time.

Double folding wings are used, by dual-control operation. Dual deck equipment is present operation from carriers is enabled.

► **Engine Choice**—Gannet's design team specified turboprop power from the start because of the Admiralty policy against gasoline on carriers. (This applies to future Fleet types—most



DOUBLE MAMBA used by Gannet is a compact unit turning out about 3,000 hp.

PACKAGED, Functional Electronics



A typical Servomechanisms, Inc., computer for aircraft control systems.

Packaged, Functional Electronic Controls for Defense and Industry

Servomechanisms, Inc.,...pioneers in the design and production of packaged function "building blocks" for electronic and electro-mechanical control systems. Each block in the system is an inch-wide packaged function easily plugged-in or out of pre-wired chassis. This technique simplifies maintenance and reduces the "time-consuming" problem to a minimum. Both 40 and 400 cycle blocks are available for system synthesis. Servomechanisms' packaging technique provides the military and industrial designer with:

- Special Adaptability
- Interchangeability
- Tuning Simplicity
- Ease of Assembly



MEASUREMENT-CONVERSION



AMPLIFIERS-ADAPTERS



POWER SUPPLIES



MODULATORS

SERVOmechanISMS

Part Location, Inc.

POST AND STEWART AVES., WESTBURY, N. Y.

© Servomech. Co.

Roll! Now usually one gearbox for fuel.)

Since most of the life of the aircraft would be spent at cruising power, a two-engine installation was suggested. Reason for this was that the specific fuel consumption of a gas turbine engine increases as the engine is throttled down. Thus, one large engine throttled for cruise would use more fuel than a smaller engine running near maximum power, assuming both engines to be put out the same amount of power.

This led to the idea of using two smaller engines running both when needed, but planning to cruise on one only, with the other shut down. In addition to the advantage with respect to fuel, the life of the engine is increased. Engines can be used alternately during cruise, to distribute the wear on both halves of the powerplant. And because of the usual props there is no effect threat to wear about during single-engine operation.

► **Low Maintenance**—Service maintenance statistics are not yet available, but Armstrong Siddeley engineers see no reason why the maintenance required for turboprop engines should not be about that of the turbopump. AS experience has been that gas engines in queue about half the maintenance men hours per flying hour that piston engines require.

And there is no reason, says the corporation, why the overhaul period and ultimate life of the turboprop engine should not be at least as great as for piston engines.

The advantages of the two halves of the Double Mustang raise a question in the amount of speed to be sought.

All three factors combine to give first cost, maintenance, personnel and operating costs.

► **Easy on the Eyes**—Photos of the General show that the exhaust nozzle from the Mustang is only the farthest off even position, which means a low seat level in all power cruise stations. This will result in greatly lessened neck fatigue on long operational flights thus improving crew efficiency.

The turboprop installation is also easy on the ears, there is no fan noise from the exhaust nozzle. Usual means of flame-damping for piston engines are bulky and cause extra drag, loss of power and hazy view. As plus, this too would be the General's least virtue will not be visible because of the curvature of the turbine as it leaves the housing.

Automatic propeller feathering is another feature of the Double Mustang. In the event of failure of one half of the powerplant, the feathering motor goes into action as soon as it senses that the propeller is attempting to windmill that engine. (This occurs, of course, as soon

You Can Fly Anywhere

With this Pair!



**Socony-Vacuum
Credit Cards
Honored Nation-wide,
World-wide!**

AS AFFORDED here and abroad, the sign of the Flying Red Horse is also a sign of friendly service and friendly credit. Your Socony-Vacuum credit card is honored wherever you are this sign. Contact local office for your card.



Signs of Safety and Performance...

**AT HUNDREDS
OF AIRPORTS**

SOCONY-VACUUM (U.S.) INC., NEW YORK, N.Y. AND AFFILIATES, AMERICAN PETROLEUM CO., CHICAGO, ILL. (U.S.A.)



Thousands of America's leading companies are using Flying Tiger Air Freight. Are You?

FLYING TIGERS...AND OTHER BUSINESS HUNT ON "CAN DO"

Write for FREE AIR FREIGHT WAY TO LOWER COSTS AND BETTER SERVICE

The Flying Tiger Line Inc.

GENERAL OFFICES: 4000 AIR TERMINAL, BUREAU, CALIFORNIA, CABLE: FTYTOS

in the net threat is now from that engine.)

Power Production—The powerplant is controlled in a single lever for rich full of the engine, fuel and pump controls are linked with these individual controls so that operating is as simple as possible. A temperature is also as requested so that the pilot gets the power output of either engine directly. In tropical climates, the power out put of the turbo-prop engine drops more than a comparable piston engine does in the case of the Double Mustang, water methanol injection is being developed and will be installed. This will largely make up for the power decrease with increased temperature.

Airline operations with the other way, and the power output of the engine is increased with decrease in temperature. Experience to date has shown that the engine can be started without oil dilution or any other special precautions down to about minus 45°. Using a typical oil should enable starts to be made down to minus 45°.

Dust and dirt don't seem to bother the engine much, although possible erosion of the compressor or turbine blades may result. With dust, compressor blades, the engine is able to operate in sandy conditions without trouble. For use reasonable length of time. Some tests were made with an engine which had light after compressor blades, in that case, about 15 lb of sand was injected into the engine, and it continued to function satisfactorily.

Future Development—The Double Mustang is really in the beginning of its development life. It can be assumed that improvements in both power output and fuel consumption will follow. Amusingly, Scales says that there is considerable development potential in the engine when oil is not needed in current power with reduced specific fuel consumption. And they emphasize that these improvements will be obtained without sacrificing engine life and durability. They say to be achieved by improving engine efficiency, and not by merely making it hotter. In fact, one of the approximations, these improvements will be made at the expense of the use of new materials which could allow higher working temperatures to be used.

—DAA

Army Finds New Uses For Aircraft

The Army Engineers say they've developed a new "road method" of mapping and analyzing the terrain with mobile "to eliminate the time-consuming conventional ground survey methods."

Only airborne equipment needed is an aircraft with lights or flares and a



The new Collins SIR-3 VOR receiver

The leader in VOR Leads again!

It was 1945 when Collins tossed the challenge ball into the radio industry's court. Collins has been showing leaders ever since.

First demonstration of the Collins VOR air show VOR speaker and instruments were made in January, 1947, for Airline, commercial airline engineers, and the Air Transport Association's research group. Collins designs were approved.

Within a year, orders for VOR equipment were received from America, Canada & Southern, Northwest, Pan American and United. Since then almost every leading airline of the United States (and, most recently, Air France), as well as many other of European airlines, have adopted the SIR as standard.

Collins has earned and is widely accorded the leadership in the VOR field and today, by a wide margin, is the largest producer of airborne VOR receivers and accessories.

In radio navigation equipment, it's...

COLLINS RADIO COMPANY, Cedar Rapids, Iowa

15 W. 4th St. NEW YORK 14

1837 Irving Blvd. DALLAS 2

3300 W. 95th Ave. MINNEAPOLIS



HIGH MACH NUMBERS really mean— **CLOSE TOLERANCE** **STRUCTURAL DESIGNS**



The shear pin features the closest tolerance of any standard fastener, providing fit, flexibility to work to any angle and the capability of splitting, will remove manufacturing tools.



The close tolerance shear overcomes design problems where conventional shear pins are impractical or unable to meet fastening requirements. Available in numerous standard sizes of 125,000 psi and 140,000 psi.



The close tolerance shear permits smooth up-locks, essential to increased speeds, and low noise flow. Rigid or flexible as required without bending or other fastener work or damaged holes.

hi-shears are made in the U.S.A. by

hi-shears, INC.
1124 TOLLANCE AVENUE
LOS ANGELES, CALIF.



Another Corsair Sweeps the Skies

Chance Vought comes up with the AU-1, heavily armored ground-support version of its famous fighter.

It looks like a Corsair, and it's called a Corsair. But it's no longer the F4U—it's Chance Vought Aircraft design's AU-1, latest version of the renowned Corsair.

Recently a conversion from the F4U-5 fighter-bomber, the AU-1 design was spotted by the Korean conflict. The new craft uses a single-stage Pratt & Whitney R-2800-61W, respectively, engine. Major changes have been made in the engine installation because of the change in engine type. Increased armor protection and offensive armament were also included in the conversion.

► **Ground-Dugout**—The Corsair has performed noble in Korea. Navy and Marine Corps pilots have been ground Red forces from the airbase offices of F4U-5s and F-4s. But fighting from those units was not enough, evidenced. The Red air attacks for improved, even their small arms fire was fatal at times. Pilots were being dropped off some of the protection of strike squadrons. They had to go hunting in the valleys and close to the ground.

Navy's Bureau of Aeronautics wanted a new—or at least, better aerial—plane to do the ground-support job. They decided to save time and money by converting the F4U-5 fighter-bomber, which was already in action. The result is the AU-1.

There were advantages in doing it this way, instead of waiting for delivery of a new plane. The Corsairs were on the job; they were also in production. Conversions could be made rapidly and reach the Korean theater in time. Far less, service personnel would know the craft, and spares and maintenance wouldn't be much of a problem.

► **One More Change**—So Vought,

which had done about everything possible with the old-fashioned Corsair, set about to do one thing more. There were the changes.

The AU-1 is not a high-altitude fighter, it works down with the ground troops. So the two-stage engine of the earlier Corsair was replaced with a single-stage R-2800, and this did away with the supercharger. With the inter-cooler eliminated, there was space in the engine installation to mount the oil cooler, taking them from their exposed location in the wing roots. As for the oil coolers, it flows in through the wing root intake, discharged into the recovery compartment and throttled by a flap at the bottom of that compartment.

Wing root intake also provide the carburetor change air on the AU-1. But eliminates the nose cone scoop which was a recognition feature of the F4U-5. Actually, the 5 change air ducts remained in the same position as the AU-1, and a reversing job closed off the nose scoop which.

A low level warning system was made a part of the oil system. This was a direct result of Korean experience, where the pilot would have no lower edge of winging, tail fin until the oil system dropped and the engine stalled. Now, if a hit should be scored on a corner in its own location, the pilot can switch to a bypass line which routes the oil past both sensors. This way he could probably get back to base here with his Corsair—and a tank of very hot oil.

► **More Armor**—There had been armor plating in the F-4 but the AU-1 got a lot more. Additional protection was included against fire from front and underneath. The pilot's hot bucket,



HELPING AMERICA BUILD FASTER **Truckers and Beechcrafts team up for profits**

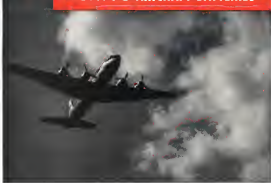
Company-owned Beechcrafts help keep wheels turning in the trucking and transportation industries. Key men have complete mobility of action. Because their time of time is divided so much in 1955, they have more time for the home office, more time for field trips, too. Name any American industry — and there you'll find Beechcrafts.

Find out today's double job of building defense production and keeping up the flow of consumer goods, executives find Beechcraft ownership more valuable (and profitable) than ever. Investigate. Call your Beechcraft distributor. Or write Beech Aircraft Corporation, Wichita, Kansas, U.S.A.



FOR YEAR-ROUND, ALL-WEATHER DEPENDABILITY

Exide AIRCRAFT BATTERIES



Exide means battery dependability. It means power and capacity equal to every need—in normal service, in emergencies. Exide batteries respond instantly when needed, absorb heavy power loads momentarily, deliver top performance, fight after flight, year after year.

With Exide dependability you get assurance of long battery life, low cost maintenance, all-round battery economy... and safety. For Exide Aircraft Batteries see a development of continuous research-engineering that keeps steady pace with aviation's increasing battery needs.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 2
Exide Batteries of Canada, Limited, Toronto
Exide Ltd. (London) Ltd. Ltd.



Exide is the best aircraft battery buy... AT ANY PRICE

1888...DEPENDABLE BATTERIES FOR 64 YEARS...1952

engine bearing, replace mainline, engine and fuel pump areas and the fuel tank all are covered now. And in spite of the cabin structure being carried around, the weight about breaks even. The same plate structure was about balanced by the engine weight saving. Amount of data is restricted, in small. But the picture shows five rocket pylons under the starboard wing, and possibly there are the same number under the port wing. What the crew are (judging by the external covering) is anybody's guess, but the chances are that they are a 10-man command group.

So the Conquer flies on. It's 17 years and 13,000 airplanes old. It's been a fighter, fighter-bomber for low- and high-altitude duties, a night fighter, a weathered fighter and a photographic craft.

Now it's in attack phase, and even there the chain doesn't break. The F4U 7 is being lined up for production for the French under Mutual Defense Assistance Program. It will have most of the features of the A-1, and in addition, be suitable for work at higher altitudes.

How Smooth? GM Gage Tells

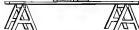
Checking surface finish of machined parts is the job of the Surfagage, a new portable instrument developed by the General Motors Corp. research labs and licensed for manufacture to an independent firm.

Surfagage is small—8 in. by 10 in. by 8 in. high—and can be taken anywhere in the factory where electric current is available. It's rugged enough to be used in outdoor production work, on the line, instead of in the inspection lab.

There is a pickup on the Surfagage



Exide is the best aircraft battery buy... AT ANY PRICE



For **HEAVY DUTY** combined with **LIGHT WEIGHT**

Repos Panels, low pressure reinforced laminates of fiberglass, nylon or other synthetic materials, act as strong as steel though lighter than aluminum... of low moisture absorption and high temperature resistance. These panels, excellent for aircraft backing board and cargo floors, are manufactured in sheets as large as 4 x 9 feet and can be made in any thickness up to 1/2".

For aircraft-type sandwich construction, Repos Panels are used in conjunction with a core of STROX (GCA). This expanded plastic, produced under duPont license, is lighter than balsa wood and possesses great structural strength.

In addition, we offer complete facilities for matched die molding, vacuum bag molding and the fabrication of laminated phenolics, wood, nylon and melamine products.

We are now producing hundreds of different aircraft parts if you are planning a new product or precision part or redesigning an old one, feel free to consult our large staff of skilled engineers and chemists.

Repos Plastics by Russell

REINFORCED PLASTICS CORP.

TWO SOUTH 10TH STREET • UNDERHILL, I.I., N.Y.

STOCK CORPORATION
AIRCRAFT SPECIALTIES CO., INC.

REPAIR PLASTIC COMPANY

ALABAMA PRODUCTS ENGINEERING CO.

WESTERN INDUSTRIES SUPPLY CO.

Los Angeles 42, California

Los Angeles 19, California

AIRFREIGHT SAVES MORE THAN TIME...



ask us to prove it!

Do you think of airfreight as a time-saver only? You'll change your mind when you learn of the dollar savings possible through...low Airfreight rates...minimum packaging costs...less money tied-up in "in-transit" goods...and fewer inventory requirements at point of sale. Ask a Slick representative to figure your savings via Airfreight as compared to Air or Rail Express.

Slick Airways Inc.

A Certified National Airfreight Center

Call toll-free
SLICK
airfreight office

Atlanta
Boston
Buffalo
Chicago
Cincinnati
Cleveland
Dallas
Denver
Detroit
Houston
Los Angeles
Miami
Minneapolis
New York
Philadelphia
Portland
San Francisco
Seattle
St. Louis
Tampa
Washington, D.C.

LOS ANGELES
CALIFORNIA

Performance puts more Sensenich Propellers

Right on the Nose

Experience is the most reliable teacher...and Sensenich, as the largest manufacturer of light aircraft propellers, has more designing, more engineering and more production experience than any other manufacturer. Performance dictates Sensenich propellers...and pilots prefer them!

WING...Fixed Pitch-CAA approved up to 132 hp **WING**...Fixed Pitch-CAA approved up to 135 hp
WING...Variable Pitch-CAA approved up to 150 hp **WING**...Variable Pitch-CAA approved up to 150 hp

Write for Bulletin and Price list

SENSENICH CORPORATION • LANCASTER, PA.

Proper propeller results in all kinds of most propellers from Sensenich \$100.00 up



with a damped stylus. The sleep data shows the pickup over the surface of the post in a maximum, and the more scope section of the sleep over the bulb and valleys of the pore is signified to a high sensitivity transducer. The transducer converts the mechanical motion to an electrical voltage read on the meter end of the page.

NBS Study Explains Circuit Noise

Circuit noise generated in shielded cables by mechanical vibration and shock, which can be a problem in high-impedance electronic circuits, can be greatly reduced by a method developed by the National Bureau of Standards.

As a result of the investigation, NBS has developed a theory which is now explained in previously little understood wave phenomena. Several methods for lowering the mechanically induced noise by factors up to 200 to 1 have been devised by NBS and are described in detail in the Technical Report No. 1045.

THRUST & DRAG

Certainly the most conspicuous trend in aviation today is aerodynamicism. There are air bubbles in that word in its correct form, but as much for as people shudder at "aerodynamicism." Most aerodynamicists get their teeth when their class application ends up short one syllable. It's like calling an engineer an engine or a metallurgist a "metallurgist." Keep it spelled aerodynamic and pronounced "no-dinamic" instead.

During the 15 years' tenure of E. H. Hesterman as chief engineer at Douglass Aircraft Co. (E.H. Hesterman joined the United States has taken delivery in 1957 75,000 aircraft, planes built to his design. This figure total is believed to outnumber the total of attack planes built in over other nations in the world.

Research in the United States is about four to five times as strong as it was before World War II, says the 1956 Statistical Abstract, Columbus, Ohio. The survey is spreading almost six times as much on research in 1957 as it spent five years ago. The reason for this is explained by inflation, the reason the ratio is so remote three for four is that increased efficiency of research has offset inflation costs of research materials.

-DAA

FOR HYDRAULIC FITTINGS • BOLTS • NUTS • SCREWS • ELECTRICAL FITTINGS...CALL

LINAIR!

One in a Million!



Of the millions of fittings in the market, you can always be sure with a LINAIR hydraulic fitting, as in all LINAIR fittings, in your inventory of highest quality material and workmanship. LINAIR fittings are made to the highest standards. LINAIR fittings are made to the highest standards. LINAIR fittings are made to the highest standards. LINAIR fittings are made to the highest standards.

Our built-up stock is 100,000 for the convenience of instant supply.

LINAIR
AVIATION SUPPLY

229-235 Hardy Avenue
Inglewood 5, California

Chicago 8-3741
TOL 1041 7542 • NUX Explained

Hydraulic Fittings • Bolts • Screws • Nuts • Washers • Electrical Fittings
SERVING THE WORLD'S FOREMOST AIRCRAFT MANUFACTURERS

PARKER Meets
Material Specifications
Within .001 of 1%



PARKER was one of the first to use modern Spectrograph analysis to determine percentages of elements present both in incoming raw material and in finished Die Castings. This operation is examining a photographic negative and is able to determine through line densities the amount of each alloy and impurities within .001 of 1%. This is one of the reasons why Parker is able to meet any material specifications.

Constant testing assures you of exactly the correct alloy.

Consult with Parker on your next Die Casting requirements.

Parker White-Metal Company - 2153 McKinley Ave. Erie, Penna.

PARKER ALUMINUM and ZINC
Die Castings

PRODUCTION

AMC Procurement Pace Slowed

Recent scandals, political pressures, organizational changes, inexperienced new help all are factors.

By Byron C. Desprey

Within the recent months, the procurement operating level at Air Materiel Command has changed its pace—with a resultant impact that has been reflected in dealings with manufacturers, representatives and other contractors personnel handling Wright-Patterson AFB. Facts are that the brass and project engineers are aware of the problem situation, and will stay that way until someone in authority will define the word.

Then there are the procurement irregularities or exceptions—and these were well and handily built in problems, in the view of AMC officials. Several cases have been extracted, from March, for example. All hinge on the word "system," which has become an authority to mislead or not to service personnel with whom industry does business.

Contract W-540-60-A-1000 for two transport aircraft was one of the first to be cancelled. Contractors were told that a competitor was to be the better one because it was not with a better contract.

And industry is often misled in some respects. For some companies, military orders go off a series of bid contracts and the competition in that field of production can be awarded to let or not and report under cover awarding.

Back of all these factors have been some recent organizational changes. Research and Development, formerly done by the AMC Engineering Division, was formed into a new command. Air Research and Development Command, with headquarters at Dayton, The Wright Air Development Center has been set up to handle the project engineering staff and testing equipment, while the AFMPC procurement machinery is in place.

Presently, AMC's role is the Air Force operation is to provide the best equipment available in adequate quantity to hold the Air Force mission. That means different policies exist now in a budgetary situation. When that mission finally is under one roof the uniformity of policy is an almost sure way to a more efficient operation.

How it functions—largely of the internal factors, then, is the size of the

operation, which determines the needs, does the timing based on that factor, and then the size of the production effort, and a given distribution in shape to be functional, in the correct amounts and on a schedule that is so interlocking as to be dismantled unless all the varied steps work properly. It is simple—there are no variables without variables, and a sufficient of the two is so much immediate material without the electronic brain that go into the first variable.

The human element, touched off a chain of action in all departments, stands immediately below, available for a buying program which approached peak years of World War II. Now, there is a lot of money and money now is called to action and the command is going to be, in fact, in fact, on an industrial basis.

This situation has been duplicated, with the result, in many similar situations. Along with highly specialized help, both military and civilian, come the inevitable misperceptions that make the inevitable misperceptions in almost any situation.

Deconstruction—Considering that AMC procurement is too large for its

own efficient operation, the question of deconstruction arises. For instance, why not set up a mobile buying unit in New York, machine tools or other Detroit or Cleveland, etc.?

Although that is done by other armed service components, AMC will produce arguments that the necessary administrative costs for such a unit are too high. The same officials will cite the past record of losing procurement money into areas of project officers. A widespread decentralization would not duplicate of such a unit, but it would require a lot of money to set up a unit in each of the major areas.

The external influences are increased. Some are political. Others are not. The biggest factor is the lack of a price control program.

Cloutier is popular with other representatives who have a great tendency to take the cheap in behalf of a new contract without first ascertaining whether the value has a net gain.

Political. Many Training—first situation is in the recent Air Force program sponsored by Air Training Command in which private flying schools facilities for basic flight training. That program was cancelled more expensive and applied for more money because of political pressure in connection with increasing federal funds and in behalf of money of flying schools located in commercial districts.

Discussing budgets for aircraft, then, pricing legislation through a matter of fact is another external source of influence and a contribution to the confusion in the procurement process. In the best job, possible in the shortest time. When that time is shortened by



AVRO OREDA DELIVERED TO SGMAR

Pratt & Whitney Canada model 1000 is the most powerful engine being installed on the AVRO OREDA. The engine is the 10,000-hp model 1000. The AVRO OREDA is the A. V. Roe Canada CF-100 all-weather fighter, now in large scale production for the RCAP.

And with more than 7,000 lb of thrust per shaft, the afterburner must double the thrust of the engine in the 10,000-hp thrust class. The AVRO OREDA is the A. V. Roe Canada CF-100 all-weather fighter, now in large scale production for the RCAP.



TWA*
TRANS WORLD AIRLINES

Emblem of Global Flight



From San Francisco to Bombay the familiar red "TWA" sign is truly the designation of a world-wide service . . . a service that reaches the four continents of North America, Europe, Africa, and Asia. TWA has been a leader in the development of post-war transoceanic civil service . . . high altitudes, "over the weather" flights that led to introduction of cabin pressurization . . . and forward technological advances . . . the use of de-ice equipment . . . the automatic pilot and automatic direction finders. This trail has been a steady advance of really new TWA routes. On the domestic side alone, revenue passenger miles have increased tenfold in the last twelve years. In 1940, the year Bendix® Radio equipment was first used by TWA, 158,000,000 revenue passenger miles were flown. By 1951, this had increased to 1,675,000,000. During the period of rapid growth and expansion TWA has continued to rely on Bendix equipment for dependable communications and accurate navigation.

Circle 1 on card

*Relies on

Bendix Radio
most Trusted name in

VHF Transmitters • H.F. Transmitters • Radio Control Panels • Antennas • Indicators • Radio-aid Radio Composites • Radio Mount Brackets • Accessory Systems • VHF Command Radio and Navigation Receivers • Inter-Communications Systems • H.F. Receivers • Ground Controlled Approach Landing Systems • VHF Omni-Directional Range Systems.

flow legislative personnel, it stipulates an other handle along the route to build up an adequate air defense.

► **Progress Report**—AMC has noted progress in a number of directions—44 signed orders to add to efficiency or save operating costs. Some of them include:

• **Disbursing Office.** Set up in each of the six postwar district offices, that office enables prompt payment after performance of contracts. It is estimated that approximately \$2.8 million a year will be realized by taking advantage of contractual discounts. The fastest method of paying through one central office not only cut the government discounts, but was a source of inflation to contractors.

• **Revolving Oil.** More than a million gallons of fuel would sagre oil was collected, re-refined by private contractors and put back into use at a savings of money and cut in the drain of the nation's petroleum supply.

• **Packaging Studies.** In course of a mechanical "growth" plan, the department, the Supply division was able to come up with some blow-by-blow data on the pending various types of containers stored which shipped lengths, distances. Findings are being applied to current shipping practices and are resulting in less damage. Considering that AMC handled 5.3 million tons of equipment last year, the savings can be quite important.

• **Fixed Pricing.** A new emergency field repair system, adaptable to forward areas, is the Maintenance division's contribution to the war effort. The method involves better and easier teamwork, expended on airplane, back to rear bases and over to the States, for certain types of repairs.



Hazards Cut on Factory Trolleys

A new trolley system which can be adapted to existing space has low level conductors to make them safer as being installed at the El Segundo plant of the Douglas Aircraft Co., according to the designer of the equipment, Kenyon Mfg. Co.

The equipment, designed to rail



ENGINEERS
AERONAUTICAL
ELECTRICAL
MECHANICAL

LOCKHEED
AIRCRAFT
CORPORATION
GEORGIA DIVISION
MARIETTA, GEORGIA

TOP-FLIGHT POSITIONS

available in LOCKHEED'S long-range program for Engineers with successful experience in aircraft design, electronics, flight test, research, or design-ware production work.

Write at once to Mr. Frank J. Palmer, Engineering Dept., 1641 Preston St., Marietta, GA.

IF A PERSONAL BELIEF is awakened, you will be awakened for transportation experience.

AND

should a job with LOCKHEED involve, your having experience will be rewarded.

LOCKHEED offers, nationwide, with only, low cost group life, health, accident insurance, cash bonus with your credit union for savings and low cost financing, employment, immediate study, regular performance reviews to give you every opportunity for promotion, on-the-job training in special areas of the corporation, where needed.

If you apply the New South, our factory will be generally awarded to LOCKHEED at Marietta, Georgia, where other openings are available.



NEW BENDIX AMSPEAKER
Relieves Fatigue . . .
of Constant Listening Watch!

For the first time in the industry, Bendix® Radio is offering a simple, compact combination loud-speaker, amplifier and power supply. The combination design makes it possible to enjoy quickly the comfort, convenience and relaxation of cockpit speaker operation without involved installation problems. Just mount one near each crew member, connect 115 volts AC with audio and mating control from the crew-member's job-box and the *Amspeaker* is ready for operation. Write for further details.

Circle 2 on card



Complete, ready-to-install, 4" speaker 115" class, 115V AC, 115W 400 cycles.

Relies on

Bendix Radio
most Trusted name in

BENDIX RADIO DIVISION of
BAIRDORCE & MARYLAND



Export Sales: Bendix International Division, 75 Park Avenue, New York 17, New York
Domestic Distribution: Radio Supplying Products, Inc., 4000 MacArthur Street, Oakland, California

CONTINUOUS or SPOT WELDING of ALUMINUM

WELTRONIC 3-PHASE FREQUENCY CONVERTER



SCIENTIFICALLY DESIGNED AND BUILT FOR PEAK EFFICIENCY

The Weltronic frequency converter operates in continuous with a 3 phase welding transformer distributing the load over the three phases of the power supply. The three phase output circuit is an extremely high power rated and a low E.M.F. device.

Emergency converter control mechanism prevented destruction loss.

The three phase frequency converter type control provides a low rate of current rise which reduces spitting and arc pickup thus permitting improved weldability.

Resistance is controlled by a selector switch which is not made in the control of welding current. The selective action of the switch is reduced approximately in proportion to the reduction in frequency, providing the desired advantage of being resistance sensitive.

Weltronic three phase frequency converter controls are available for all types of continuous and spot welding operations.

Weltronic converter can be operated in a number of major aluminum plants.

Complete literature will be provided on request.

Weltronic Co. 19500 W. 8 MILE RD.
Detroit 19, Michigan

two: Maryland, Massachusetts, Michigan, New Hampshire, New York, North Carolina, Pennsylvania and Rhode Island have been designated for preferred treatment.

The Mountain Road division doesn't authorize the payment of higher prices as contracts in labor surplus areas, but states that it may later authorize such price differentials in the present order. MR simply allows surplus area firms the opportunity of meeting prices obtainable elsewhere.

• Blocks of competitive bid contracts can be held back for negotiation with local labor surplus areas. After receipt of competitive bids, the "set aside" would be negotiated with surplus area firms at prices equivalent to the lowest competitive bid obtained elsewhere.

• On negotiated contracts, when the "most acceptable" item has been awarded, firms in labor surplus areas shall have the opportunity of meeting these terms.



Shapes Jet Blades

Lafayette in the line of production tools specifically for aircraft component work is the "Compressed Control Jet Blade Grinder," produced by the Norton Co. in Worcester, Mass.

This machine is built for rapid, precise grinding of the external axial surface of jet engine parts including blades, buckets, vanes, nozzles and other items. Parts are, if desired, be ground in automatically controlled operation, removing the need for highly trained specialist at the machine, and ensuring production uniformity, consistency.

Blades are held on an arbor between

ENGINEERS — LOOK TO THE FUTURE WITH NORTH AMERICAN

The engineering department that quantitatively measures the "beat" at the right time—A-24, F-41, F-42, now the F-48 Sabre jet series, A-1A, F-4, F-105, F-106, B-44—often engineers a real opportunity to become a part of the advanced aircraft design that has changing roles for tomorrow and the future of aviation. It's an engineering career in the aircraft industry by writing for complete education in aircraft engineering at North American. Please include a summary of your education, background and experience.

North American Factors—

Solves engineers with ability and experience • Paid vacations • A growing organization • Complete employee service programs • One of living wages • Six paid holidays a year • Plant facilities and equipment • Excellent opportunities for advancement • Group insurance plan • Sick leave time off • Generous travel allowances • Retirement plan • Low cost group health, accident and life insurance • A company 24 years young.

CAREER OPPORTUNITIES in North American

Aeronautical
Aircraft Engineers
Aircraft Designers and Draftsmen
Specialists in all fields of aircraft engineering
Aircraft engineering graduates
Engineers with skills available to aircraft engineering

NORTH AMERICAN AVIATION, INC.

North American Aviation, Inc. is a leading aircraft manufacturer in the world. Engineering Personnel Office, Los Angeles International Airport, Los Angeles 40, Calif., September 24-26, 1952.

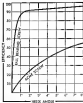


FRICTION-FREE TRANSFER OF ROTARY TO LINEAR MOTION with Saginaw Ball Bearing Screw Jack

- Permits faster operation, forward or reverse • Requires less power
- Compact design • Light in weight
- Remarkably low resistance • Practically unlimited in application

The Saginaw Ball Bearing Screw and Nut, up to 1000 lb. thrust, and one of the most efficient means of transferring rotary into linear motion known today, is widely used in automatic strapping devices. It is nearly superior in efficiency to the conventional screw drive.

The Saginaw Ball Bearing Screw and Nut permits the use of lower horsepower motor drives in applications, reducing overall weight, gives faster operation with less heat generated, and allows replacement in reverse action with minimum friction. It is compact in design, light in weight, and requires very little maintenance.



Threaded type nut—Two-circuit assembly



Flange-type nut—Two-circuit assembly

Write for Saginaw's new factual booklet on the ball bearing screw and nut principle.

Saginaw
STEERING GEAR DIVISION
General Motors Corporation, Saginaw, Michigan

SSM PRODUCTS
DIVISION • FRANKLIN • CHRYSLER • PONTIAC
CHRYSLER • PONTIAC • CHRYSLER • PONTIAC
CHRYSLER • PONTIAC • CHRYSLER • PONTIAC
CHRYSLER • PONTIAC • CHRYSLER • PONTIAC

THE RIGHT R-F NOISE FILTER FOR THE JOB



Tailored to fit!

That's the way Sprague likes to make radio interference filters for aircraft electrical and electronic equipment. Sprague filter engineers have a wealth of experience in designing ingenious mounting arrangements and case shapes to fit in cramped quarters. Moreover, the filters they design to meet these tough mechanical requirements have excellent insertion loss characteristics and are designed to withstand aircraft operating temperatures, vibration and shock beyond the stiffest specification limits.

Write today for help in solving your radio noise filter problems!

SPRAGUE
PIONEERS IN ELECTRIC AND ELECTRONIC DEVELOPMENT

SPRAGUE ELECTRIC COMPANY
NORTH ADAMS, MASSACHUSETTS

IMMEDIATE DELIVERY
from 2 of the
Largest Stocks of

**Aircraft
Quality Steel**

SHEET • STRIP • PLATE • BAR

4130 N.E.A. 1000 PL. 1048 ANNEALING
AN-QQ-5-115 AN-QQ-5-116 AN-QQ-5-117



ZIEGLER STEEL SERVICE CO.
1000 E. HANCOCK BLVD. 210 WEST 26th ST.
LOS ANGELES 25, CALIF. WICHITA 2, KANSAS

uniformly driven, left-hand and right-hand slope producing units which mount the figure "37" rotors to the rotor for grinding blade forms. Blade design determines the number that can be held in the wheel at one time; custom design permitting two or three blades to be accommodated. The wheel is removable, permitting the operator to speed work in loading new wheel while another is at work in the machine.

USAF CONTRACTS

Following is a list of recent USAF contracts announced by Air Materiel Command.

Tempesta, General Motors Corp., Dayton, Ohio 45424, \$148,000.

Wescott, M. J. Co., 1975 So. Ave. No. 40, South Bend, Ind. 46711.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.

Boehm, Schenck Co., 10000 W. 10th St., Denver, Colo., 80202, \$14,100.



When Nobody Knows the Answer

One of these days you may encounter failure with a metal problem that does not seem to have an answer.

That is the time to think of these International Nickel Companies metallurgists. They are constantly improving and modifying nickel alloys to meet new conditions. They are always ready to help you with specific problems involving metals for aircraft use.

Over the past 50 years, Inco has developed a family of metals for hundreds of different applications in one branch of the family, for example, is a group of heat-resisting alloys—Inconel®, Incoloy®, Nimonic®, Monel®, and Invar®—all now important to the aircraft industry.

Elsewhere on the family tree, you will find other alloys—each with certain special characteristics. Often, there is a better-than-even chance that one of Inco's alloys offers exactly the properties you are looking for.

Of course, this does not mean that somebody at Inco can dip into the files and come up with a put answer to every new problem. All the answers have not been found yet. But a tremendous amount of research has been done, and you can probably benefit in one way or another from it.

When nobody knows the answer, Inco's metallurgists keep going until they have investigated all possible metals and alloys that might

do the job. In fact, the men in Inco's Technical Service (and on their Corrosion Engineering and High Temperature Engineering Services, as well) have one primary goal: to help you determine whether or not Inco's Alloy or some other metal will serve your purpose best.

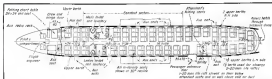
No matter what your metal selection problem may be, all the technical facilities of Inco are available to help you solve it. There is no charge, no obligation of any kind. For prompt technical help wherever you need information about metals, all you have to do is get in touch with "Technical Service."

THE INTERNATIONAL NICKEL CO., INC.
67 Wall Street, New York 6, N.Y.

INCO
NICKEL ALLOYS

MONEL® • INCONEL® • INCOLOY® • NIMONIC®
INVAR® • NICKEL • 10W CROCON NICKEL • SERRAVALLO®
BUNIPAL® • INCOBELL® • INCOLOY® • INVAR®

EQUIPMENT



PAA's Tourist Cabin, De Luxe Cockpit

- DC-6B for ocean coach converts to luxury plane.
- But fully instrumented cockpit stays the same.

By Scott H. Bronger

For a new concept in trans-Atlantic air travel—the tourist service beginning May 1—Pan American World Airways is putting into service a fleet of 36 Douglas DC-6Bs which in many respects represent a new concept in transport aircraft.

Two major revisions set PanAm's DC-6Bs apart from other planes of that model: If the tourist traffic does not develop as anticipated, PanAm can convert its 62 passenger tourist DC-6Bs (which the carrier calls Super 62s) overnight into 44 or 56 passenger tourist transports. And the Super 62, either as a tourist or a first-class plane is perhaps the most completely instrumented aircraft ever to take to the civil service.

In addition, the performance of PanAm's DC-6Bs is superior to previous models of that plane. Gross weight is 107,000 lb., range increased to 500 miles. The new Pratt & Whitney R-3600-CB17 engines, each develop 105 hp more at takeoff than present DC-6B engines.

Pan American's Douglas Super DC-6B may be found in cabin appointments, but it is a super de luxe in cockpit appointments. According to Sperry Gyroscope Co., "it is the most completely equipped airplane for its ground communication and electronic navigation." Flying today in commercial service, the instrument panel includes the latest or latest models. It is the first in which PAA's idea of how an instrument panel should be ar-



CONTINUED: RADIO CONSOLS (foreground) is new via instrument is representative

anged time been fully implemented, as PanAm's engineers. Layout is based on long studies of pilot efficiency and fatigue factors. It does not necessarily give CNA viewpoints on the subject.

Sperry Gyroscope—With Sperry alone PanAm probably will spend well over \$1 million for cockpit gear in the first 10 outfitting of each fleet of 36 DC-6Bs. It already has spent almost \$1 million, including spares for the first 30 planes.

Radio controls are arranged near each and controls that are less than 100 ft. below on accompanying craft, mounted down as they are in radio gear. These controls for the most part are combined in a speechless display on the top of the control pedestal be-

hind the pilot and co-pilot. It more aspects, PanAm's DC-6B cockpit is better equipped than its Stratoliner, the carrier says. The \$77,000 example, doesn't have extensive provisions for distance measuring equipment, nor is it equipped internally with the Sperry Zero Reader for guiding the pilot into a field when the weather is shut in.

The DC-6B also has Sperry's automatic approach coupler and the Bendix Operating The Zero Reader presents given steering information, which the Operating gives PanAm personnel or displacement information.

The Super 62 is the first transport with both Zero Reader and auto approach coupler.

The beginning of PanAm's Tourist

SPS aircraft fasteners



**STANDARD
"SIX-SIDED"
ENGINE BOLTS**
All listed diameters
—check and internal
wrenching types, AN
specifications.

**NAS
SHEAR BOLTS**
Clear interference,
High strength, flush
head type.

**NAS INTERNAL
WRENCHING
LOCK NUTS**
Superior safety
nuts made from 34"
to 1/2".

**NAS INTERNAL
WRENCHING
AIRFAST BOLTS**
Largest NAS speci-
fication. Bolts are
fully formed by
rolling after heat
treatment.

INFORMATION UPON REQUEST, ADDRESS DEPARTMENT 316

FLEXLOG



**FLEXLOG SELF-
LOCKING NUTS,
REGULAR TYPE**

Both wing and lock nuts.
One piece construction, re-
sults segments lock posi-
tively with uniform torque.
Aircraft approved, sizes
#4 to 1/2" include. Reg-
ular steel FLEXLOG approved
for temperatures to 250°F.



**FLEXLOG SELF-
LOCKING NUTS,
BUSH TYPE**

Less than regular height,
yet conform to accepted
standards. Every thread,
including the locking
threads, comes to above
of lock. Have all regular
FLEXLOG features. Full
size weight and height.
Aircraft approved, #8
to 1/2".



**FLEXLOG EXTERNAL
WRENCHING NUTS**

Incorporate Tension
Positive self-locking prin-
ciple and one piece, self-
mated construction. Latest
NAS specifications. Sizes
from 3/4" to 1 1/2" NF
Thread Series Approved
for temperatures to 250°F.

INFORMATION ABOUT FLEXLOG ON REQUEST, ADDRESS DEPARTMENT 316

AIRCRAFT PRODUCTS DIVISION

STANDARD PRESSED STEEL CO., JENKINTOWN 3, PENNSYLVANIA



NEW

VICKERS

EDV* PUMP



*Electrically Depressurized Variable

The new Vickers EDV Pump is a variable delivery, piston type pump which automatically delivers the hydraulic fluid at rates from zero to full rated volume... governed by the demand of the load. In addition, on electrical control latches the pump at zero delivery and pressure when no fluid is required. The instant there is any demand, the pump automatically delivers the volume of fluid required at full pressure.

The arrangement has many advantages, particularly on long flights. In the first place, the power required by the pump in the "latched zero" position is negligible. Fuel savings in the order of 700 lb per flight have been estimated. This saving can be used to increase payload or to extend range.

As the pump does not circulate any fluid in the "latched zero" position, if any fluid is damaged (e.g. by gunfire) fluid loss is confined to that line... the pump does not empty the reservoir.

The pump is not stopped in the "latched zero" position... it operates at normal speed but at no load. It is ready the instant demand occurs... nothing has to be brought up to speed. Other advantages are low maintenance costs and longer periods between overhauls. It can often simplify hydraulic systems. For additional information on the Vickers EDV Pump, ask for Bulletin A 3202.

AUTOMATICALLY DEPRESSURIZES

entire hydraulic system when demand ceases

AUTOMATICALLY RESTORES

system pressure at instant demand recurs

4014



ZERO READER gets close spot on Puckin' panel. Top row, second from left: Bendix. Drawing is of various sight units used before it for DMEs.

service the Puckin' marks the last long first use of the Zero Reader in cross-country service. A suit built of about five DMEs working Pan-Am's Mode route, however, has made use of the Reader for some months now.

The Super 6 also uses Sperry's engine analyzer, developed originally by a Pan-Am engineer, but this is standard on all PAA's planes. The scope and switches for the analyzer, which detects faulty engine operation during flight and puts its finger on the cause, is located on an overhead radio rack to the right and slightly above the head of the flight engineer who sits on a task-mounted sliding chair in the aisle just behind the pilot and co-pilot.

Why Bells-Here are the reasons Pan-Am goes for using both the Zero Reader and the automatic approach computer (if you want, you don't agree with the need of having both). Both the Reader and automatic approach system as fed the same steering information from a common computer. In one case, the human pilot handles the controls, guided through his windshield by keeping the Reader on the "reference" in the other, the autopilot operates the controls. The automatic approach system permits operation in lower weather minimums than would be wise under manual control with a simple transparent bearing displacement indicator.

Feature of the automatic system is that weather might tend to "lose" the pilot. But the Reader then gives the state steering information that was fed to the autopilot before failure.

Thus, as an emergency, the Zero Reader would become a primary instrument. It is therefore placed in a prominent position at the top of the panel, one of the closest positions where it is close for the pilot to watch it and at the same time reach through the windshield for sight of the engine.

While the arrangement of the flight instruments, as to Pan-Am's specifications, and radio controls have been considered more than used on the product, the other instruments, switches and controls follow pretty much the pattern found in other DMEs.

Radio Gear—No other planes in the Pan-Am system use as much, equipped with radio gear in the Super 6. Most of it is transmitters and receivers are located at the top of the panel and consist of four to seven relays which serve to split the flight deck in two—each having its own independent radio gear. The flight engineer slides back and forth between the two rows above the center aisle on a task-mounted chair.

The radio gear includes:

- VHF radio receiver. Dual transmitters/receivers. Type 1851, 20 channels. This is important to be replaced in multi-channel sets that include some model features that Pan-Am has will have considerable impact on radio navigation techniques.
- HF receiver. Supplementary set 2 to 20 m.
- VHF communication dual set 2 receivers modified to 30 channels. Pan-Am says it won't buy more until some questions on the VHF communication spectrum are settled. There is talk of splitting channels in



how high is UP?

Higher Altitudes plus Higher Speeds mean Greater Stresses and Strains. Aircraft are only as strong as the Fasteners used in their assembly. Fasteners miles above the earth's surface are in high Altitude flying. With this thought in mind, the Briles Manufacturing Company has made our bolts to withstand every stress the stress, or strains required regardless of speed or altitude.

We specialize in Aircraft Fasteners, Flight Head, Internal or external Hex-heads, made to A.N. or N.A.S. specifications.

Rigid inspection at every phase assures you of quality, precision, close tolerances.



Other Briles Bolts:

- 1/4" to 1" diam. x 1/2" to 1" long
- 1/2" to 1" diam. x 1/2" to 1" long
- 1/2" to 1" diam. x 1/2" to 1" long
- 1/2" to 1" diam. x 1/2" to 1" long

Stainless Steel Nuts:

- AN 306 • 304 • 304-C • 304-L



VICKERS Incorporated • 1462 OAKMAN BLVD., DETROIT 33, MICH.
DIVISION OF THE SPERRY CORPORATION
ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



Flight Simulation WALK-IN ROOMS with VIBRATION and ACCELERATION TEST FACILITIES

Bowser Environmental Simulation Test equipment has always been foremost in the field. Now, to comply with latest government specifications, Bowser introduces walk-in rooms with its temperature ranges from -100° F. to +250° F., relative humidity simulation from 20% to 95% and simulated altitude simulation. In addition, these rooms are specially designed to be equipped with vibration machines to simulate simulated testing under conditions of vibration, acceleration, low temperature and altitude.

Bowser Walk-In Rooms are engineered for completely automatic control. Doors, available up to the full size of any walk-in, can be mechanically controlled to conform with dimensions of size, space and weight. Performance characteristics, such as rate of climb, and down, etc., are available to meet any government or research specifications.

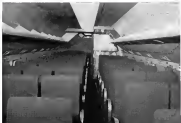
Check our MAIL TODAY

BOWSER MAIL ORDER SERVICE
Send information on any featured product:
☐ High Temperature
☐ Low Temperature
☐ Humidity Control
☐ Vibration
☐ Altitude
☐ Shock
☐ Foreign Business
☐ Sales and Service
☐ Literature
☐ Inspection Panel
☐ Energy Flight
☐ General Equipment

Name _____
Company _____
Title _____
City _____ State _____ Zip _____

BOWSER

TECHNICAL REFRIGERATION
DIVISION BOWSER INC.
TOLSONVILLE, OHIO



MAIN TOURIST CABIN accommodates 71 with full chest seating. Reasonable seats are lighter and narrower than counterparts in the lower series.

a 50 lb. separation basin while space of the second VHF transmitters have been designed around a 100-lb. separation basin.

• **VHF auto navigation.** Dual 20-channel VHF communication capabilities versus and full instrumentation, offer Collins SR-1 or 2 receiver or Bendix MN-616 receivers, depending on availability. While these sets provide extensive VHF reception capability, Puffer bought them primarily for Channeling and ILS navigation (beacons), its engineers told Aviation Week.

• **VHF automatic direction finder (ADF).** Dual receiver, Bendix MN-61A.

• **Meteor beacon.** Single Bendix MN-51B receiver.

• **Glideslope (GLS).** Dual 20-channel receiver, Collins SR-2.

• **Lema.** Single R-65/SFN-9 set, high range altimeter (accelerometer) on microphone's push-to-tape SR-715 radio set, low range altimeter (PMS) on SR-715 radio set, 1100, capture level of APRN set.

• **Distance measuring equipment (DME).** Mounting provisions and wiring for Federal OMA set where available.

• **Fire Protection.** The new DC-60s are among the first planes in this country to be protected by an automatically operated engine fire extinguishing system in event of a crash. It will be triggered by an auto switch which is actuated on crash impact. This feature, long used in England, was given close scrutiny before acceptance in this country because it was feared it might go off at the wrong time. For this reason, the British manufacturer's crash switch has been effective there.



SPECIAL TRACKS on floor make removal or adjustable spacing of seats easy.

This aspect switch is made by Walt to Kalle & Co., Inc.

Another safety feature is the use of Skidrol, a non-flammable hydraulic fluid, developed specifically by Douglas and Marmar & Company Corp.

Other safety measures include Packard-designed lightning rods, positive protection for engine lightning rods, protection over heat warning system "airflow" gas lock installation, special lowing lat rebound deck and emergency lighting system equipped by impact switch.

• **Seats.** Kalle & Co. of the Super's versatility is the universal floor. Special tracks in the floor, running the length of the cabin, permit Super's or Tourist seats to be specially removed or installed in any spacing desired. Aviat

ment is an aircraft manufacturer. Packard claims to hold a patent on the floor design.

Both seats and tracks in the Douglas cabin are built to withstand 10G crash loads, well beyond GAA requirements. Following Coast Super Research recommendations, an impact is used where the load is likely to strike. Top of seat back is formed of sheet metal designed to "give" on impact and absorb load (boom).

Another CRB proposal adopted. Seat backs are built to collapse forward at a specified crash load. Passengers who lean back so they can be folded forward to make a more compact package to handle and to give ground crews more space while working on aircraft.

Seats are custom built by Aviatronics Corp., Buena Vista, Calif., and use "Teflon" cushioning. This is said to be stronger and 20% lighter than other cushioning materials of comparable quality.

Lockdown is made by Seavey Rubber Products Co., Shafter, Calif. • **Comfort.** Seats for Super's are in a 100° recline (55°) and so-called leg rests, they are spaced almost five feet apart (37 in.). Tourist seats are simpler, somewhat narrower (17 in. between arm rests, 19 in. deep), and are lighter than their heavy counterparts. They don't have leg rests, being spaced about 35 in. apart. But there is enough room underneath seats to feet for a passenger to extend his legs.

More seating room can be gained on the Super's seats, on the right side of the cabin, by using the provisions to retract the armrests in the cabin.

Instead of using leather or painted sheet metal, sides of the seats are covered with material "Boltex," a plastic product made by DuPont. DuPont's Boltex is a plastic product made by DuPont. Boltex is a plastic product made by DuPont. Boltex is a plastic product made by DuPont.

The front Super is to be divided into two passenger seats, a forward compartment seat, seating a maximum of 14 persons (12 in business flights), separated by the frontiers from the main cabin which seats up to 71 people. Entrance to the plane is through the left side of the fuselage, off at the wing line, at the door is a staircase gallery, put large enough to stow one sample meal for emergency and store coffee. Seats are stored in extended baggage racks using the length of the cabin.

Two tanks are in separate compartment spaces equipped with an extra tank burner. In addition there are two barometer tanks with venturi wash burner only to handle the high-density load. Exterior walls of the fuselage are painted in "Fluorocarbon," a product of O. S. Plywood Corp.

Color scheme of the cabin is blue,

ENGINEER'S NOTEBOOK

POWER PLANTS

Multiple Take-up Clamp Simplifies Shroud Connections

The outer ring of the Duraclad HEP-3 hollow is designed to replace the structure from heat generated by the burner engine. Marmar multiple take-up clamps provide a simplified means of connecting the shroud sections together. A very fine titanium shroud section, together, is used to maintain the structural integrity employed to compensate the operational expansion. Clamps were spot-welded to the edge of the shroud, making it to apply a coupling system in addition to the clamping system usually associated with this type of design. The clamps bring about significant savings in weight, cost and ease of assembly and disassembly. The patented T-tube lock makes a vibration-proof positive seal at all times.

Save Time, Weight, Money with Marmar

FOR INFORMATION AND LATEST CATALOG, WRITE BOWSER, INC.

MARMAR

PRODUCTS CO., INC.

2400 N. FLORENCE AVE.
INGLEWOOD, CALIFORNIA

**INSTANT
AUTOMATIC
FLOW**

SHUT-OFF

**QUICK
RE-CONNECTION**

**WHY
Genuine
HANSEN
COUPLINGS**

**GIVE BETTER SERVICE
LAST LONGER**

**Step of
Safety Assembled
Coupling
Better Seal**

**Just Twist
Minimum Force
Locking Device**



**PICK GENUINE HANSEN COUPLINGS
FOR BETTER PERFORMANCE . . .**

**Step of
Safety Assembled
Coupling
Better Seal**



● To connect a Hansen coupling, you merely push the plug into the socket with one hand. Push a compression. To disconnect, push back down on socket-coupling flange. Flare is done at instantly and automatically.

Write for catalog, price complete range of sizes and data.

REPRESENTATIVES

ALABAMA	ALBERTA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA

REPRESENTATIVES

ALABAMA	ALBERTA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA

REPRESENTATIVES

ALABAMA	ALBERTA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA
ARIZONA	ARIZONA	ARIZONA	ARIZONA

THE HANSEN MANUFACTURING COMPANY

4001 WEST 120th STREET • CLEVELAND 11, OHIO



Wanted
ENGINEERS
AND
SCIENTISTS

These top positions include preliminary and production design in advanced systems groups and control systems including as the monitor.

Secondary positions include:

- Weight control engineers
- Electronic project engineers
- Electronic system/mastering engineers
- Radio engineers
- Flight test engineers
- Stress engineers
- Aero- and thermodynamics
- Service mechanics
- Power plant installation designers
- Structural designers
- Hydro-mechanical designers
- Electrical installation designers

Write today for complete information on these exceptional savings programs. Please include amount of your experience and training. Address inquiry to Director of Insurance.

NORTHROP AIRCRAFT, INC.
1983 E Broadway
Booths 400-401 (San Jose/Anaheim/Orlando/Dallas)

**DOUBLE BACKED
ADVERTISING**

Advertisement rates appear to be a sensitive indicator of job growth and the overall health of North Dakota's economy, and they're up.

Display Advertising: how past came before the public and builds a group

Diets that experimentally prove Diets **Effective!** If you want your weight right in the numbers you want to reach, our personal video tips will influence the outcome.

In view of present day difficulties in maintaining your own mailing lists and efficient personalised service is increasingly important in securing the comprehensive medical services you need and want.

Only the basic detailed information beyond that is pertinent to the law enforcement and the social effectiveness of the law enforcement.

Los Resultados



McGraw-Hill
HIGHTSBURY CITY, NEW YORK

McGraw-Hill Publishing Co., Inc.

© 1999 West Group, New York, NY, U.S.A.

Yellow and gray in varying shades. Blue flowers are covered with a soft, wooly good-looking Vase? plastic rings (RCN 18) are clipped by R. J. Condover in one junction with Panter standard rings worn. They are tough and easy to clean. A sponge looking makes the raggedest and sets in a second dead zone.

At last, a plastic with cloth backing, made by Goodrich, is used exclusively on walls just up to window level on the dark gray, yellow, above. Coffey & Ashman, a New York fabric house, supplies the window curtains, a heavy wool "Cash Montana" material, and the seat covers a blue rayon fabric called "Nubuck."

• **De Luxe Versions**—The Super 5 Clipper can quickly be stripped bare of its finest furnishings and luxuriously armed for the cargo trade. Douglas representatives told Aviation Week staff that this can be done in less than 14 hr.

To appreciate how vast is the change wrought in so short a time let's say you already have seen the Texas Clipper and now are entering the plane after its conversion to a luxury model. You no longer run out forward as the

ride as you come through the main entrance. A large gift, contained on black jute wrap. You are in what amounts to a foyer. In place of arch directly across the aisle there now is a coat room and a stewardess waiting to take your hat.

Next thing you notice is that it is solid underneath. Each 100% wood carpeting rests on top of the planks, not just fits between screens. The sides are real. The main cabin has been cut into two by the galley and coat room.

In back, you sit, knees relax, three 4-in. cont. rails, a seven-place lounge and bigger "Munich" seats, all two place. Seat rails can be individually customized. Only 14 persons use this rear circuit.

Up front in the open cabin are seats for 27 persons, with the same accommodations as in the rear, except there are no upper berths. Further forward, past the lavatories, eight persons can be seated where there was room for 14. Two upper berths have been added.

The galley bar, three times the size of the smaller galley, sections off the main deck, is just another of the accessories recently installed along with seats and other gear.

The galley, made by Merrifield Aircraft Products, Mansfield, Ohio, costs about two thousand dollars for each of its passengers. Besides the hot, two ovens are built in for actual cooking and for heating precooked meals. Galley also has a refrigerator, sink for washing, water containers, electric hot cups and other kitchen uses.

EYES OF FLIGHT

Eyes of Eight—the P-280s canopy, dome, nose, windows on today's fighters, bombers, transports, helicopters. Through these transparent shields against wind and weather, the men who fly our country's planes obtain their all-important unobstructed view.

SOME OF THESE PLEXIGLAS ENDOMERS ARE MICROCLATHRATES, SOME ARE LAMINATED. MANY ARE FORMED FROM PLEXIGLAS II, THE IMPROVED GRADE OF THIS ACRYLIC PLASTIC, WITH ITS INCREASED RESISTANCE TO HEAT, WEATHER, AND CRACKING. ALL OF THEM HAVE THE CLARITY, STRENGTH, LIGHT WEIGHT, FORMABILITY, DIMENSIONAL STABILITY, AND WEATHER-RESISTANCE THAT HAVE ESTABLISHED PLEXIGLAS AS ACRYLON'S STANDARD TRANSPARENT PLASTIC.

To make the most efficient use of PLEKOLAS in aircraft applications, call on the Baker & Haas service staff and technical representatives. Their services are backed by years of close cooperation with the aircraft industry on the design and installation of PLEKOLAS enclosures.

Parham is a member of the U.S. Dept. of Energy's National Nuclear Security Administration, and the U.S. Dept. of Defense's Joint Military Operations Center.

Comments: Recaptured: Crystal Lake & Piscon, Ind., 126 days; June 22, James Street, Toronto, Ontario, Canada.

Downloaded At: 11:53 11 September 2009

PLEXIGLAS

**ROHM & HAAS
COMPANY**

WASHINGTON COUNTY, PENNSYLVANIA, U.S.A.

Abstract ■ *Psychological distance* is a subjective feeling of being separated from others. It is a common experience that people feel more psychologically distant from those who are geographically distant than from those who are geographically proximate. This paper examines the relationship between psychological distance and the use of technology. We propose that technology use is related to psychological distance in that technology use is more likely when the user is psychologically proximate to the technology than when the user is psychologically distant from the technology. We propose that technology use is also related to psychological distance in that technology use is more likely when the user is psychologically proximate to the technology than when the user is psychologically distant from the technology. We propose that technology use is also related to psychological distance in that technology use is more likely when the user is psychologically proximate to the technology than when the user is psychologically distant from the technology.

ADEL

MOTOR DRIVEN PUMPS FOR AIRCRAFT

ADEL presents a wide range of Motor Driven Auxiliary Heater, Anti-Icing, Hydraulic and Fuel System Pumps with a wide spread in capacity and application. Carefully designed and manufactured by ADEL, they meet or surpass all AN standards to provide dependable pump performance. Drawings indicate the compact, relative scale of dimensions. ADEL also produces a complete line of Auxiliary Hydraulic and Pneumatic Control Equipment, Engine Accessories and line supports.

For complete engineering specifications and catalog, address ADEL DIVISION, GENERAL METALS CORPORATION, 1875 Van Owen St., Burbank, California.



Manufacturers of Aircraft Equipment

DIVISION OF GENERAL METALS CORPORATION • BURLING, CALIF. • NEWTON, N. H.

CHANDLER DIV. AIRCRAFT & POWER ENGINEERING CORPORATION, CHICAGO

#20983 FUEL HEATER PUMP

4 GPM at 40 P.S.I.
Continuous 24 V.D.C. motor
Weight 1.45 lbs.



#20620 SERIES "M" DUAL OUTLET HEATER OR ANTI-ICING PUMP

24 to 24 G.P.M. per port
at 20 P.S.I.
Continuous 24 V.D.C. motor
Weight 3.75 lbs.



#24000 SUBMERGED FUEL BOOST PUMP

40 GPM at 12 P.S.I.
Continuous 24 or 12 V.D.C. motor
Weight 2.5 lbs.



#23450-2 EMERGENCY HYDRAULIC SYSTEM PUMP

4 G.P.M. at 1500 P.S.I.
Intermittent 24 V.D.C. motor
Weight 7.5 lbs.



#23383 PROP FEATHERING PUMP

5 C.P.M. at 1000 P.S.I.
Intermittent 24 V.D.C. motor
Weight 55.0 lbs.



fixed together. It consists of the nut proper, and a ground washer, pressed onto the first welded, threaded section at the bottom of the nut.

Close to the locking action, Winch torque compresses the washer, forcing the thin-walled area to constrict to cause around and lock reliably and easily to the bolt. When the thin-walled section has tilted off the head it can stand, it elongates slightly, permitting the bulk of the head to move up into the same body of the nut. Consequently, the high stress concentrations and torque loads on the first three threads vanish; the work is relieved, and in the end the capacity of the nut to take high wrench torque loads is raised.

Klocher Fastener Corp., 2152 Highland Ave., Indianapolis, Ind.



Tool Reduces Setups

A new tool holder built to speed production by eliminating much setup work contained under various bearing and housing shells, has been developed by the Davis Boring Tool division at Giddings & Lewis.

The holder, constructed from different cutting tools at once, enables the operator to turn, undercut, bore and chamfer in one setup. A single universal adjustment permits it to be rotated to any of eight positions, through a ball castle in 45 deg. steps. The holder is held in the selected position rigidly and accurately, via the company's "key-locking" and index pin arrangement. "A major trend of the trend and now have produced the cutting tool for the next generation," it explains.

Davis Boring Tool div. of Giddings & Lewis Machine Tool Co., Farm Dale, Wis.

Scup Makes Steel



HOW Modern IS CANADAIR?

Equipped to meet any challenge in aircraft production... Canada's machine shops, assembly and engineering departments are on a par with modern concepts with any plant in the world.

The most advanced production methods are in operation... latest personnel have been drawn from the best sources throughout the globe... facilities have been installed in the latest equipment... all meeting today's exacting demands of aircraft manufacturers.

Here Canadair has produced many 4 engine airplanes, is producing F106* Sabre jets and preparing for quantity production of jet and conventional engine trainers.

... Canadair is as modern as the planes she builds.

* Built under license from North American Aviation, Inc.

Canadair

LIMITED, MONTREAL, CANADA

A subsidiary of
ELECTRIC BOAT COMPANY
New York 20, N.Y. • Washington, D.C. • Chicago, Ill. • Toronto, Ont.



Bendix-Skinner

ORIGINATOR OF MICRONIC FILTRATION

the *Finest*

Name in Filtering



Whenever there can be no uncertainty about the name of filtration, rate of flow or filter collapse, Bendix-Skinner gets the call. In fact, Bendix-Skinner has been handling the hardest jobs for over twenty years. From this experience have come new and exclusive filtering techniques that assure better performance on any job, are more out of ten. Write for details of the filters backed by Bendix and built by Skinner.

Over 200 Bendix-Skinner filters are in service (100,000) throughout the flow rate from 1 to 2000 g.p.m.



SKINNER FURNISHES DIVISION OF

10-10 Skinner Avenue, North Plainfield, New Jersey 07063
 Tel. 908.766-1000, 7-1000, 7-1111, 7-1112



*"The Most Liberal
Pension Plan
In The Industry"*

*"The Fastest Growing
Co. In The Industry"*

• We do believe that FINDEX is the most rapidly expanding company in the industry... that our greatest plan in the next three to five years. We would like to tell you more about FINDEX in detail. If you are writing a connection with a company whose product line is industrial, we want to be the defense of our country, with its export program for the expanded commercial market when the defense job is completed.

• Estimated 40 to 50 new work positions are the creation, group has plant facilities, power, equipment, paid vacations & holidays. Clean, modern, well lighted buildings in prime locations. We are looking for men in this line center of Philadelphia. Excellent wages at plant entrance. Work and learn with a leader, with the BEST equipment in the industry.

• WE NEED
TOOL DESIGNERS

ENGINEERING
DRAFTSMEN

... with several experience in Airframes, Controls, Electrical Installation & Power Plant Installation.

• AND
ENGINEERS

... for Flight Test, Instrumentation, Structural Test, Materials and Process.

• WRITE
... giving detailed resume of experience and education to—

Engineering Personnel Manager



Placem Corp.
 Morristown, Pa., Near Philadelphia

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

Where you will find THE REAL REVOLUTION

"If we keep in mind the values of opportunity, competition, democracy, productivity, then it is our capitalist society which is the truly revolutionary one—the only society which offers true hope to the masses for release from the long nightmares of tyranny. It is we, not the Marxists with their reactionary ideas of the good dictator, who have the truly constructive, the truly revolutionary ideal."

—from "Captivity" by David McCord Wright.

If we can only win recognition of this truth, we shall win the struggle of free men against communism. This editorial discusses some of the hurdles that must be cleared.

To win the needed recognition that "our capitalist society... is the truly revolutionary one," we must keep pounding away both abroad and at home. That is because the communists simultaneously attack us on an international front and try to undermine us from within.

The present drive to rearm ourselves and our allies is crucial to our self-protection on the international front. We must be prepared to meet the armed force of aggressive communism with armed force if we are to secure our physical freedom.

Arms are not enough

But to re-establish parity in arms is only half of the battle. In the last analysis it is not the mere important half. To be effective, our arms must be backed by loyalty of men

to our ideals. So, both abroad and at home, we must win men to the faith that we do have "the truly constructive, the truly revolutionary ideal."

On the international front, the effort to win adherence to such faith in our capitalist society meets tough going. That arises from the fact that in some of the countries that are allied with us in the fight against communism, capitalist society has offered to its people no such ideal. In varying degrees "the values of opportunity, competition, democracy, productivity"—these key aspects of American capitalism—are either absent or subordinated in their economic life. Indeed, the *Wall Street Journal* recently remarked that "to the European, capitalism has become synonymous with cartels—and with the disregard cartels foster for the consumer, the worker and the over-all well-being of the nation's economy."

No Simple Solution

Nonetheless, many European labor and governmental leaders sincerely believe that cartels are essential to their economic salvation. They believe that without such restrictions in congested European markets there would be intolerable cut-throat competition and instability of employment. Thus, when we point out that the cartel capitalism so prevalent in Europe lacks the constructive qualities of competitive American capitalism, we may offend European leaders whose wholehearted cooperation we need in the fight against communism.

But, if we soft-pedal that contrast, we sacrifice the opportunity to win understanding and loyalty from millions of Europeans who have had no chance to learn that capitalism can be the constructive and liberalizing force that it is in the United States. Indeed, when many of these millions embrace socialism it is not because they love it. They are rather desperately seeking a tolerable middle course between what they consider the heinous extremes of communism and the undesirable aspects of capitalism as they understand it.

New name not the answer

We know that there is no easy way to handle the problems created by such misunderstanding of American capitalism. Neither do we share the belief that much of the difficulty would be overcome if we were to call American capitalism by some other name. By doing that, the argument runs, we shall relieve it from the unpleasant connotations that are attached to the word capitalism in some other parts of the world. But, after all, if we are to give up all the terms that have come to mean something else in other parts of the world, we must begin by ditching the term "democracy" which, in the official jargon of the Kremlin, seems to mean what we call dictatorship.

In spite of the difficulties, however, we must stick to this job of exporting the truth that our capitalist system does offer opportunity, competition and democracy. We must let the rest of the world see that it means a continuous drive for increased productivity, and the search for profits by increasing sales and consumption, not by trying to sell less for more.

Export alone not enough

The spreading of truth about American capitalism will not be effective if it is merely directed abroad. Unless it is carried on at

home also, it will lack the driving force that is essential to any convincing export of that type. Nor will export alone come to grips with the communist attack on our country from within—an attack that gets too much help from loyal Americans who short-sightedly repudiate the basic principles of our institutions in their efforts to reform some of their deficiencies. For success both at home and abroad, we must have right here at home a much more militant recognition that it is in fact our capitalist society which offers "the truly constructive, the truly revolutionary ideal."

Here at home, too, this means difficult complications. Businessmen who are among the leaders and principal practitioners of capitalism, have generally been catalogued as conservatives. Hence, many people must stretch their imaginations a bit to see that businessmen are leaders of a development which has so greatly and so rapidly improved the lot of free men in America that it is truly revolutionary.

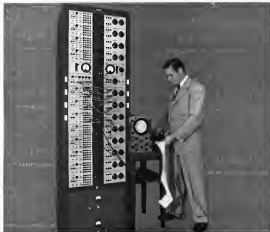
These difficulties of definition, however, are relatively superficial aspects of the problem of seeing our capitalist society clearly. The basic facts are that:

American capitalism is leading free men to an ever higher material standard of living while respecting their spiritual, social and political freedom.

Communism is leading its people back into a life of servile regimentation under dictatorship.

American capitalism advances to high ground never before attained by free men. Communism retreats to ground that men wish an appetite for freedom throughout the ages have sought to escape. If we can establish this truth firmly, around the world, we shall no longer need to worry about communism. It will be hopelessly sunk.

McGraw-Hill Publishing Company, Inc.



Survey in dynamic profile with the Boeing Computer, workhorse of flight deck itself.

What's it like to be a Boeing engineer?

Boeing engineers enjoy many advantages—among them the finest research facilities in the industry. These include such advanced aids as the Boeing designed Boeing built Electronic Analog Computer shown above.

This is part of the stimulating back ground that helps Boeing men maintain the leadership and prestige of an Engineering Division that's been growing steadily for 35 years.

If you measure up to Boeing standards, you can share that prestige. And you'll work with motivated engineers on such vital projects as guided

missiles, the still-classified E-32, the second shattering jet jet B-47, and other outstanding developments.

These are excellent opportunities, right now, for experienced and junior engineers for steady.

**DESIGN • RESEARCH
DEVELOPMENT • PRODUCTION
TOOLING**

also for semi-mechanics and electronics designers and analysts and the physicists and mathematicians with advanced degrees.

You can work in Seattle, in the Pacific Northwest, or in Wichita, Kansas. You will receive a generous moving and travel expense allowance. And

as a Boeing engineer, you'll enjoy pay that is good and grows with you.

You'll be proud to say, "I'm a Boeing engineer!"

Write today to the address below, or see the nearest office.

JOHN E. SANDERS, Staff Engineer—General
Dept. EN
Boeing Defense Supply Center in West
Boeing's representative of Boeing Engineers and Scientists is the nearest office.

Name _____
Address _____
City and State _____

BOEING



Engineers...
it **PAYS YOU**
to figure all
advantages.

SELECT
YOUR AVIATION CAREER
CAREFULLY!

BEECH AIRCRAFT CORPORATION

has openings for:

DESIGN ENGINEERS
ELECTRICAL ENGINEERS
MECHANICAL ENGINEERS
STRUCTURES ENGINEERS
AERODYNAMICS ENGINEERS
TOOL ENGINEERS

HERE ARE THE ADVANTAGES:

Working Advantages

Top pay rates. Five and one half day work. Liberal vacation policy and sick leave. Excellent opportunity for advancement. Wide variety of products. Versed engineers—each engineer is an individual and can do engaged work. Long range work schedule.

Living Advantages

Small town atmosphere with city advantages. Unsurpassed school system—kindergarten through university. Top ranking university school of aeronautics offers night classes for graduates without advancement to completion of engineering degree. Versed but not extreme climate. Many facilities for recreation and entertainment. Live within a 30 minute drive of work.

**SEND THIS COUPON NOW! OR MAKE APPLICATION
GIVING FULL RESUME OF YOUR QUALIFICATIONS**

Personnel Department

BEECH AIRCRAFT CORPORATION
7001 EAST CENTRAL, WICHITA, KANSAS

PLEASE SEND ME COMPLETE INFORMATION AND RECENT APPLICATION FORM.

NAME _____

ADDRESS _____

CITY _____

OCCUPATION _____

I AM INTERESTED IN THE FOLLOWING ENGINEERING POSITION:

RECENT ENGINEERING GRADS

Are You Interested in Getting
An Advanced Degree?

If you want to combine work and study, and at the same time gain experience in research techniques and gain employment opportunities, then you are eligible to receive a research project stipend while you attend graduate school. This type of experience includes research facilities and facilities of instruction in the U. S. Midwest.

University of Wisconsin
Department of Engineering Lab
Research Research Center, Stevens, Wisconsin

ENGINEERS

Our military aircraft design program affords excellent opportunity to engineers with aircraft experience. We have openings in structures, layout and detail (small) aircraft company. Open time work schedule.

ANDERSON, GREENWOOD & CO.
Muskegon Airport Muskegon 17, Texas

AVIATION

Flying Tiger

WFO

CO-PILOTS

over 100 hours

475 powered hour in 10

Student Pilot/Flight

FLYING TIGER LINE

WICHITA 675 TECHNICAL

in and at Wichita, Kan.

Business, technical

PRODUCTION MANAGER WANTED

Industrial & Electrical Engineers—Company has top experience and top equipment. Research, development, design, production, maintenance—(University, State, Federal, Commercial, Government, Defense, etc.) and other military requirements and other, limited duties.

Second positions also available for quick entry positions.

M. C. CHAMBERLAIN & COMPANY

Industrial Consultants

800 W. Douglas Blvd. Beverly Hills, Calif.

DEVELOPMENT ENGINEER

AVIATION ENGINE AND

FLIGHT TYPE INSTRUMENTS

Just another year in well needed aviation development and flight instrumentation work. We are looking for a development engineer with a B.S. in electrical engineering, preferably with a M.S. in electrical engineering, and a minimum of 2 years experience in development and flight instrumentation work. Send resume to: Personnel Manager.

34-36 38th St. New York 17, N. Y.

Aviation

34-36 38th St. New York 17, N. Y.

AC SPARK PLUG DIVISION of GENERAL MOTORS CORPORATION

PRECISION INSTRUMENT PLANT

Positions now available for highly skilled personnel in the field of electronic automatic, electro-mechanical control equipment.

MECHANICAL DESIGN ENGINEERS
ELECTRONIC ENGINEERS
SERVO ENGINEERS
ELECTRONIC DESIGNERS
MECHANICAL DESIGNERS

Have an expanding division of an established line with 30 years of successful experience in the instrument field. Work centered about the maintenance and development of highly complex equipment of the most advanced type.

Write or Apply

AC Spark Plug Division

GENERAL MOTORS CORPORATION

1925 E. Kaufman Place

Milwaukee 2, Wisconsin



Needed Now!
Cabin
Conditioning
Engineers
These men design and develop the power plant engines, the cabin conditioning system, the heating and ventilation system.

**Power Plant
Engineers**
These men design and develop the power plant engines, the cabin conditioning system, the heating and ventilation system.

THE GOODYEAR AIRCRAFT CORPORATION

Personnel Dept. - Philadelphia 2, Pa.

ENGINEERS



CHALLENGE AND CAREERS

FOR

ENGINEERS and SCIENTISTS

GOODYEAR AIRCRAFT CORPORATION

RUNS THE GAMUT OF PROJECTS

Many things and the most advanced jet fighters, transport airplanes and helicopters, guided missiles and radar systems, electronic computers, low bypass, turbofans, gas turbines, fuel tanks, wheels and brakes, and structural ballistics are in the broad or in the production stage of

Goodyear Aircraft Corporation

Concerns are being built on the solid foundation of

Goodyear Aircraft Corporation

a subsidiary of

The Goodyear Tire and Rubber Company

ENGINEERS

AERONAUTICAL
MECHANICAL
ELECTRICAL
AERO DYNAMICS

ELECTRONICS
CIVIL
INDUSTRIAL
PHYSICISTS

NEEDED TO WORK ON

RESEARCH DESIGN DEVELOPMENT

NEEDED ALSO ARE

TOOL PROCESSORS TOOL DESIGNERS TOOL PLANNERS
PLANT ENGINEERS
METALLURGISTS
HEATING & VENTILATION ENGINEERS

G.A.C. offers a planned educational advancement program applicable to experienced undergraduates as well as to graduate engineers who are experienced or inexperienced in the aeronautical field.

Salary patterns with long for extended work week. Free education, liberal vacation plan and other benefits are available.

Prompt and serious consideration will be given your inquiries addressed to:

Mr. C. G. Jones, Salary Personnel Department

GOOD YEAR
AIRCRAFT CORPORATION
AERON 15, OHIO

Let the Truth Come Out

Now that the two directors of CAA's newly important Office of Aviation Safety have laid their say on this page (last week) about our charges of inefficiency, what do we next?

First: We will see our detailed comment on their letter shortly.

Second: Let it be emphasized again that our interest is constructive, to improve aviation safety by revealing as many questionable aspects of the Office of Aviation Safety as we can discover.

Let's not forget as we read such documents as the Hertz-Davis letter that there is frequently a vast void between theory and practice, and the strivings of each.

Third: Regardless of whether congressional or other groups agree with us, as yet in the honest inquiry, we intend to keep the spotlight turned on all corners of CAA.

The Scripps-Howard newspaper's "In words are relevant: Case Light, and the People Will Find Their Own Way."

Fourth: By concentrating mainly on Messrs. F. S. Hertz and William Davis, and their CAA, we do not imply that other sections of CAA or any other government aviation agency are above comment. Why then do we concentrate on CAA?

• Because the recent CAA reorganization, we believe, was demoralizing and conducted in a high-handed manner, and we believe it was a step further away from efficiency and safety.

• And because the Office of Aviation Safety, unlike other CAA units, is the very nucleus of CAA's safety functions.

If you doubt this, read how CAA's own General Order No. 4 of Oct. 15, 1993, summarizes its functions:

"The functions and responsibilities of the CAA described below apply generally to the examination, certification, inspection, and enforcement of the design, manufacture, and maintenance of aircraft and aircraft components; the competence and physical fitness of aircrew and the flight operations and technical facilities of air carriers, other aircraft operators, aircraft schools, and other air agencies. For the sake of brevity, these functional areas will normally be referred to as 'the technical regulation and improvement of aviation safety' in the statements which follow."

Thus, CAA is the very heart and soul of government regulation for air safety. That of all places we hold top men of unquestioned integrity, intellect and administrative skill, men who can withstand political and other outside forces, men who can make sound, clear-cut decisions and stick to them, and stand behind everyone else on their staff who does likewise.

If it is our opinion that CAA does not have enough men like this, and some of those they have are not

high enough up the extensive ladder of CAA to get the right things done.

That's the role of this campaign—pest and stomp. It is not a mere fight against personalities. But the fire has been directed at the top men in CAA for this very good reason that it is they who hold the responsibility that every executive has—to conduct the organization he heads, and do it well. You can not launch criticism at him, concentrate men down the line if their losses will not back them up.

It is our firm conviction that conditions in CAA justify a continued examination as public for good reporting methods. But we still operate under a disadvantage of those who hold control and have access to all CAA records do not cooperate are better in the future than they have in the past in answering our questions. All of our questions on this page Mar 24 will remain unanswered.

Furthermore, we must omit certain accurate information and answers, even though they are in our possession, in order to protect individuals from retribution.

But we believe our readers will understand these hardships, and want us to do the best we can. Because we are fairly convinced aviation is living in a hell's paradise as long as the CAA setup is as loose and ineffective as we think it is.

We hope to enlighten you about CAA and its top people, their experience and training, their methods, their attitudes, current procedures and practices, with the resulting shortcomings and inadequacies, the gradual replacement or dilution of good engineering brains, or the overruns of "executives" or "administrators" above those who may be or should be actually familiar with the day-to-day problems and the innumerable technical changes and progress in aircraft design, operation, maintenance, and engineering, and accident prevention and analysis.

Surely, if they are sincere in their words of last week, Messrs. Hertz and Davis will welcome inquiry, and will want nothing hidden. Let the truth come out. Let the critics be heard. Then let the public and aviation make up its own mind.

Progress!

Always alert for signs of transportation progress, we must give credit to the railroad for an accomplishment in 1951, announced by the Association of American Railroads.

"The average speed of freight trains in 1951 . . . was greater than in any preceding year, amounting to 17 miles per hour for all freight trains operated by Class I railroads . . ."

"A new high record in the average speed of all passenger trains also was reached . . . for both local and through trains, at 87.5 miles per hour, compared with 87.4 miles in 1950 and 86.1 miles in 1948."

Comptroller

—Robert H. Wood



New Pump Motor Saves Space, Weight

A light, extremely compact pump drive assembly is achieved with this new 400 cycle AC motor designed and built by EEMCO. Unlike the conventional assembly which requires a gear box for reduction, this motor connects directly to a new type of tapered hydraulic pump which operates at 11,200 rpm. Coupling is by means of an internal spline drive within the armature shaft. Motor can be supplied with integral gear box and standard A-H mounting pad for operating lower speed pumps.



TECHNICAL DATA

Motor type	3 phase, 400 cycle	Power factor	80-85
Output	3 1/2 hp maximum at 11,400 r.p.m.	Starting torque	200% max
Weight	6 1/2 lbs. 21.00 lbs. including mounting plate	Breakdown torque	Above 200% max
Efficiency	82-83	Max. of movements of 2547 operation hrs. 25500	

EEMCO helps you build for the future

ELECTRICAL ENGINEERING & MANUFACTURING CORP.
4815 WEST JEFFERSON BOULEVARD • LOS ANGELES 16, CALIFORNIA

LOCKHEED T-33 TRAINER POWERED BY ALLISON
J33 TURBO-JET (Also F-80 Shooting Star)



NORTHROP F-89 SCORPION POWERED BY TWO ALLISON
J35 TURBO-JETS WITH AFTERBURNERS



GRUMMAN F9F-3 PANTHER POWERED BY ALLISON
J33 TURBO-JET



REPUBLIC F-84 THUNDERJET POWERED BY ALLISON
J35 TURBO-JET



LOCKHEED F-94 ALL-WEATHER FIGHTER
POWERED BY ALLISON J33 TURBO-JET WITH AFTERBURNER



DOUGLAS A2D SKYSHARK POWERED BY ALLISON
T40 TURBO-PROP



NORTH AMERICAN XA2J-1 SAVAGE POWERED BY
ALLISON T40 TURBO-PROP



CONSOLIDATED PSY FLYING BOAT POWERED BY
FOUR ALLISON T40 TURBO-PROPS

Around the world
ALLISON JET ENGINES
have accumulated more than
1,300,000 hours in the air

*an unsurpassed record of experience covering
every condition of training, alert and combat*



Allison

DIVISION OF GENERAL MOTORS, INDIANAPOLIS, INDIANA

Builders of J35 Axial, J33 Centrifugal Flow Turbo-Jet Engines, T38 and T40 Turbo-Prop Engines